

Network Management Manual

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Introduction

(i) General

This Network Management Manual (NMM) replaces Volumes 1 and 3 of the Trunk Road Maintenance Manual. It brings together extant policy from those two volumes together with current Area Management Memos and Network Security Notes. It provides advice, some mandatory instruction and guidance on good practice for the management and provision of the routine and winter service on the trunk road network. It generally describes the processes for the management of the maintenance service including the interface between the Highways Agency, its service providers and other stakeholders.

The performance requirements for routine and winter service activities on the trunk road network are included in the Routine and Winter Service Code, referred to as “the Code”, which is a replacement for Volume 2 of the Trunk Road Maintenance Manual. The Network Management Manual, which together with the Code, provides advice and guidance to enable the Service Provider to achieve the performance requirements.

(ii) Context

The Network Management Manual is predominantly guidance and advice, which is commended to users for consideration. However, there are also some mandatory requirements, arising from either statutory or contractual obligations.

Mandatory sections of this document are contained in boxes. The Service Provider must comply with these sections or obtain agreement to a Departure from Standard from the Highways Agency, see part (vi). It should be noted that due to formatting restrictions entire paragraphs have been highlighted where a only part of it is mandatory.

(iii) Parts

The Network Management Manual is in twelve Parts:

- Part 0 Introduction
- Part 1 Management of Health and Safety
- Part 2 Asset Management Records
- Part 3 Routine Service
- Part 4 Traffic Management
- Part 5 Winter Service
- Part 6 Network Occupancy Management
- Part 7 Traffic Incident Management
- Part 8 Better Information for Road Users
- Part 9 Network Resilience and Security
- Part 10 Programme Planning and Scheme Development
- Part 11 Administration

(iv) Style of Presentation

The Network Management Manual has been designed to enable partial revision with an amendment number and issue date at the bottom of the page. This assists in accurately recording updated and revised procedures on individual pages. These revisions are also recorded on the amendment summary pages which are issued at the same time. This system is intended to comply with formal quality assurance procedures.

Introduction

Amendments (excluding minor typographical errors) are shown by a vertical bar in the left hand margin in addition to the change in version number shown at the bottom of each page. Such bars only show changes effected from the previous version.

The Highways Agency intends that the completed document is made available in an electronic only version on both the Highways Agency portal and the internet, which provides for easier access by service providers and stakeholders. The Highways Agency intends for the document to be updated as necessary to reflect current policy.

General enquiries about the Network Management Manual and its availability and content should be directed to the contacts shown in part (ix) below.

Within the Network Management Manual there are several standard forms that have been re-typed/drawn for clarity in publication. These specimen forms do not replace the existing forms currently used by both the Highways Agency's staff and Highways Agency's service providers.

(v) Definitions

The following terms are used within the document and are applicable dependent upon the type of contract operating:

Term	Definition
Activity Promotion	The act of informing the Service Provider of the activities that are planned
Adverse Weather Report	Has the meaning given in Part 5 of the NMM
Annual Inspection	Has the meaning given in the DMRB
Area Schemes	Capital improvement schemes, such as LMNS, delivered through area maintenance contracts and including Service Provider 'managed schemes'.
Area Renewals	Renewal schemes delivered through area maintenance contracts and including Service Provider 'managed schemes'.
Approved Network	The Highways Agency's network, made up of consistently referenced Sections
Category 1 and Category 2 Defects	Have the meanings given in Part 2 of the Code
Confirm	Has the meaning given in Part 2 of the NMM
Contingency Plan	Has the meaning given in Part 7 of the NMM
Cyclical Maintenance	Has the meaning given in Part 4 of the Code
Database Administrator	A specialist resource that maintains the integrity of a database system.
Departure from Standard	The mechanism by which the Service Provide seeks to alter, amend or depart from the minimum standard set for design or maintenance standards
Design Build Finance & Operate	A contract with a Service Provider where the service includes assuming responsibility for the operation and maintenance of a length of existing road (where relevant) and ensuring that specified construction scheme(s) along the length of road are constructed and made available for road users. The Service

Introduction

Term	Definition
	Provider is subsequently responsible for the operation and maintenance of the new sections of road.
Designer	Contracting agent responsible for carrying out design and construction activities for or on behalf of the Highways Agency. Includes Early Contractor Involvement (ECI) Agents or Design, Build, Finance, Operate (DBFO) Agents. Also refers to Network Management Agents undertaking renewals or improvement works.
Detailed Inspection	Has the meaning given in Part 3 of the NMM
Developer Works	All new development works including works under Section 278 and Section 38 of the Highways Act 1980 and any other permitted development works including works under the Town and Country Planning Act or the Transport Works Act
Environmental Element	Part of EnvIS Environmental inventory. Man-made or natural assets comprising the environment within and surrounding the trunk road network.
Environmental Information System	Consists of specific environmental data supplied by Service Providers, the Highways Agency and other bodies which is collated and displayed in the Highways Agency Geographical Information System (HAGIS). This data is used to assist managing the environment and in the review and reporting of the environmental performance of both Service Providers and the Highways Agency.
Environmental Management Information	Part of EnvIS. Specific data, to be recorded in and extracted from EnvIS, to assist in the identification, planning, implementation, monitoring and reporting of the environmental management of the trunk road network. Data includes that relating to commitment(s) and management actions associated with an Environmental Element
Environmental Management Plan	An EMP is a document (or set of documents), which set out agreed procedures and standards for the implementation of identified environmental management actions. It is developed to address the adverse and beneficial environmental impacts arising from planning and design, construction, and maintenance and operation of the trunk road network.
EnvIS Management Team	The focal point of contact for all Service Providers maintaining and supplying environmental data to EnvIS standards.
Environmental Objective	Part of EnvIS environmental inventory. Assigned to individual Environmental Elements and defines its overall purpose (what it is intended to achieve in environmental terms)

Introduction

Term	Definition
Events	Planned off-network events that have the potential to impact on the operation of the Agency's network
Gateway (Business Information gateway)	Has the meaning given in Part 11 of the NMM
Geographical Information System	System used to input, store, retrieve, manipulate, analyse and output geographically referenced data. Key components of GIS are: <ul style="list-style-type: none"> – Computer system: consists of hardware, software and procedures designed to support data capture, processing, analysis, modelling and display. – Geospatial data: can be represented spatially as points, lines or polygons which represent the geometry of topology, size, shape, position and orientation. Sources of geospatial data include digitised maps, aerial photographs, satellite images and statistical tables. – Users: the roles of the user is to select pertinent information, to set necessary standards, to design cost-efficient updating schemes, to analyse GIS outputs for a relevant purpose and plan the implementation.
Geotechnical Advisor	Highways Agency member of staff responsible for providing advice on geotechnical matters
Geotechnical Asset Management Plan	Has the meaning given in Part 3 of the NMM
Geotechnical Liaison Engineer	Highways Agency member of staff responsible for liaising with the Service Provider / Service Manager
Ground Penetrating Radar	Ground-penetrating radar is a non-destructive tool that can be used to obtain information about the construction of a pavement and its internal features. Typically, ground radar can provide information about changes in pavement construction, layer thicknesses and defects and/or features within the pavement.
Hazard Mitigation	Has the meaning given in Part 4 of the Code
Hazard Mitigation Period	Has the meaning given in Part 4 of the Code
Health & Safety Executive	The organisation responsible for the inspection and enforcement of health, safety and welfare in the workplace
Health & Safety Plan	The document prepared in accordance with the CDM Regulations
Health & Safety File	The document prepared in accordance with the CDM Regulations
Highways Agency	The organisation responsible for the management of the trunk road and motorway network in England
Highways Agency Area Performance Team	Team who manage the day to day running and performance of the Network for the respective Area or DBFO
Highways Agency Geographical Information System	Graphical Information System (GIS) specifically developed and maintained by the Highways Agency

Introduction

Term	Definition
Highways Agency Management Information System	A single platform for information for all Highways Agency Directories, from simple code look up utilities to more sophisticated forecasting and reporting tools.
Highways Agency Objective	Part of EnvIS environmental inventory. Set by the Highways Agency for particular environmental topics (e.g. air quality, nature conservation and ecology, etc) stating the Highways Agency's overall aims for the avoidance, minimisation or control of environmental impacts and enhancement of environmental conditions
Highways Agency's Road Weather Information Service	Has the meaning given in Part 5 of the NMM
Highways Agency Traffic Officer Service	Service provided by the Highways Agency to deal with incidents on the Network
Incidents	Unplanned traffic incidents including RTCs and ad-hoc road closures. This does not include Category 1 Defect repairs to infrastructure damage resulting from an incident
Interim Advice Notes	Documents issued from time to time formally amending DMRB or MCDHW standards
Licensee Works	Private works executed through grant of a licence or permission under the various sections of the Highways Act 1980 including such as skip licences, scaffold licences and permissions to plant or erect structures in the highway. This category also includes maintenance works undertaken by other bridge authorities such as; Network Rail and British Waterways
Location Referencing Point	Has the meaning given in Part 2 of the NMM
Long-Stop Condition Requirement	Has the meaning given in Part 2 of the Code
Machine Survey Pre-Processor	Software that validates TRACS, SCRIM and Deflectograph Raw Condition Data, fits the data to a survey route and outputs to a file for loading into HAPMS
Maintenance or Managing Agent	Has the meaning given in Part 4 of the Code
Major Schemes	Major infrastructure capital improvements, including TPI schemes and other discrete improvement schemes not covered by any of the following definitions: Area Schemes, Area Renewals, Routine Works, Urgent Routine Works, Regional Technology Schemes, Regional Technology Works, Urgent Regional Technology Works, Street Works, Urgent Street Works, Developer Works, Licensee Works, National Technology Works, Urgent National Technology Works, Events.
National Technology Works	Works executed by the national technology contractors (GTL and TiS) under the two national PFI technology contracts (NRTS and NTCC)

Introduction

Term	Definition
Network	That part of the trunk road and motorway network covered by the Service Provider's contract.
Network Auditor	The individual who ensures that section referencing information is up-to-date
Network Control Centre	24/7 manned control room that deals with all incidents and customer care matters
Network Management Agent	Contracting agent responsible for managing and maintaining the trunk road network. Typically includes Managing Agent Contractors (MACs) or Design, Build, Finance, Operate (DBFO) Agents.
Network Occupancy Management Manual	Sets out the approach to managing the Network
Network Management Manual	Refers to this document
Network Referencing Manager	Has the meaning given in Part 2 of the NMM
Overall Requirement	Has the meaning given in Part 4 of the Code
Pavement Condition Surveys	Has the meaning given in Part 2 of the NMM
Performance Requirement	Has the meaning given in Part 4 of the Code
Permanent Repair	Has the meaning given in Part 4 of the Code
Preventative Maintenance	Has the meaning given in Part 4 of the Code
Principal Inspection	Has the meaning given in the DMRB
Project Sponsor	Highways Agency member of staff responsible for scheme or project
Road Safety Partnership	Has the meaning given in Part 4 of the NMM
Regional Environmental Advisor	Highways Agency member of staff responsible for liaising with the Service Provider / Service Manager. Regional environmental advisors provide operational support and advice to all Highways Agency Directorates on environment, accessibility, sustainable development and aspects of integration within their region. They advise on assessment, design, management and appraisal to help ensure compliance with legislation, policy and standards, in accordance with best value and sustainability.
Regional Technology Schemes	Discrete technology improvement and renewal schemes not delivered through regional term contracts or through national PFI contracts (NRTS and NTCC)
Regional Technology Works	Works delivered through the regional technology term maintenance contracts
Remote Monitoring System	A technique for detecting faults in an item of electrical equipment or subsystem, and reporting them to a remote point, such as a control centre.
Renewal Maintenance	Has the meaning given in Part 4 of the Code
Road Category	Has the meaning given in Part 4 of the Code

Introduction

Term	Definition
Route Performance Manager	Highways Agency member of staff responsible for the performance and management of a particular route
Routine Maintenance Management System	Management procedures for the routine maintenance of highways which allows all inspections and other reports, complaints and third party claims to be assessed in conjunction with the established highway inventory, previous maintenance actions and other relevant data
Routine Works	Routine maintenance works delivered through area maintenance contracts including all routine and cyclic work and ad-hoc defect repairs. This includes any routine activities that are not covered by any other category in this list, undertaken by third parties operating on behalf of the Highways Agency (such as machine surveys and site investigation works). This category also includes EPA activities undertaken by district and unitary authorities.
Safety Camera Partnership	Has the meaning given in Part 4 of the NMM
Safety Inspection	Has the meaning given in Part 3 of the NMM
Safety Patrol	Has the meaning given in Part 3 of the NMM
Scheduled Roadworks (SRW)	A module of HAPMS - The system consists of a database and a browser-based interface for the recording of lane closures on the network.
Section Referencing	Has the meaning given in Part 2 of the NMM
Section Reference Marker	Has the meaning given in Part 2 of the NMM
Service Manager	Has the meaning given in Part 4 of the Code
Service Provider	Has the meaning given in Part 4 of the Code
Severe Weather Plan	Has the meaning given in Part 5 of the NMM
Sideway-force Coefficient Routine Investigation Machine (SCRIM)	A mobile machine survey that records resistance to skidding in the wet.
Soft Estate	All areas of the highway outside of the road pavement within the ownership of the Secretary of State (some of which may be outside the operational fence line)
Statutory Undertaker (or Undertaker)	Means an undertaker for the purposes of Part III of the New Roads and Street Works Act 1991 as defined in Section 48(4) of that Act.
Street Works	Statutory undertaker works including works executed under a New Roads & Street Works Act 1991, Section 50 Licence
Structure Maintenance Manual	Has the same meaning as Maintenance Manual given in Part 1 of Volume 3 of the DMRB
Technical Area	Has the meaning given in Part 4 of the Code
Temporary Traffic Regulation Orders	Orders that are put in place to restrict speed limits or access to the Network e.g. road closures

Introduction

Term	Definition
Traffic Operations Contract Compliance Audit	The mechanism whereby Service Provider's performance is measured annually
Traffic-speed Condition Surveys (TRACS)	A generic term that describes the required surveys of pavement surface condition
Urban Traffic Control System	A system for the central control of electronic traffic control devices in a defined area which usually comprise primarily, but not necessarily exclusively, traffic signal installations.
Urgent National Technology Works	Urgent works executed by the national technology contractors (GTL and TiS) under the two national PFI technology contracts (NRTS and NTCC)
Urgent Regional Technology Works	Urgent works delivered through the regional technology term maintenance contracts (specifically, the repair of category 1 defects)
Urgent Routine Works	Urgent routine maintenance works delivered through area maintenance contracts (specifically, the repair of category 1 defects)
Urgent Street Works	Urgent or Emergency statutory undertaker works including works executed under a New Roads & Street Works Act 1991, Section 50 Licence
WebDAS	The web-based system for submitting and seeking approval Departures from Standard
Wider Road Safety Partnership	Has the meaning given in Part 4 of the NMM
Winter Maintenance Officer (& Assistant)	Highways Agency member of staff responsible for Winter Maintenance in the Route Performance Team
Winter Period	Has the meaning given in Part 5 of the NMM
Winter Service Plan	Superseded by Severe Weather Plan
Winter Service Routes	Has the meaning given in Part 5 of the NMM
Winter Risk Period	Has the meaning given in Part 5 of the NMM

(vi) Glossary of Terms

The following is a list of abbreviations are referred to in this manual.

Acronym

AA	Agent Authority
AADT	Annual Average Daily Traffic
ABP	Agricultural By-Product
ACPO	Association of Chief Police Officers
AIL	Abnormal Indivisible Loads
AFR	Accident Frequency Record
AMM	Area Management Memorandum
ANPR	Automatic Number Plate Recognition
APM	Area Performance Manager
APT	Area Performance Team
APTR	All Purpose Trunk Road
ASLEC	Association of Street Lighting & Electrical Contractors
ASR	Alkali Silica Reaction

Introduction

Acronym

AVD	Average Vehicle Delay
AW	Authorised Weight
BCD	Base Condition Data
BE	Bridges Engineering Division
BOD	Biological Oxygen Demand
BS	British Standard
CCTV	Closed Circuit Television
CD	Compact Disc
CDM	Construction (Design & Management) Regulations
CHART	Computerised Highway Assessment of Ratings & Treatments
CHE	Chief Highway Engineer
CHIP	Chemicals (Hazard Information & Packaging for Suppliers) Regulations
CIS	Construction Industry Scheme
CLAW	Control of Lead at Work Regulations
COPI	Code of Practice for Inspections
COSHH	Control of Substances Hazardous to Health
CPR	Civil Procedure Rules
CRCP	Continuously Reinforced Concrete Pavement
CSS	County Surveyors Society
C&U	The Road Vehicles Construction and Use Regulations
DA	Design Agent
DBA	Database Administrator
DBFO	Design Build Finance & Operate
DCD	Data Collection Devices
DCP	Dynamic Cone Penetrometer
DD	Divisional Director
DDA	Disability Discrimination Act
DEFRA	Department for Environment Food and Rural Affairs
DFS	Departure from Standard
DMRB	Design Manual for Roads & Bridges
DSE	Display Screen Equipment
DSEAR	Dangerous Substances & Explosive Atmospheres Regulations
DfT	Department for Transport
EA	Environment Agency
EAV	Exposure Action Value
EC	European Commission
ELV	Exposure Limit Value
EMAC	Enhanced Managing Agent Contractor
EMP	Environmental Management Plan
EMT	EnvIS Management Team
EnvIS	Environmental Information System
EPA	Environmental Protection Act 1990
ERT	Emergency Roadside Telephone
ESDAL	Electronic Service Delivery for Abnormal Loads
FS	Financial Services
FCEC	Federation of Civil Engineering Contractors
FWD	Falling Weight Deflectometer

Introduction

Acronym

FPA	Fire Precautions Act
FPG	Forward Planning Guidance
GAMP	Geotechnical Asset Management Plan
GTL	
(GeneSYS)	GeneSYS Telecommunications Ltd
GIS	Geographical Information System
GLE	Geotechnical Liaison Engineer
GNN	Government News Network
GPR	Ground Penetrating Radar
GPS	Global Positioning System
HA	Highways Agency
HAB	Highways Agency Board
HABAP	Highways Agency Biodiversity Action Plan
HAGIS	Highways Agency Geographical Information System
HAMIS	Highways Agency Management Information System
HAPMS	Highways Agency Pavement Management System
HADDMS	Highways Agency Drainage Data Management System
HAGDMS	Highways Agency Geotechnical Data Management System
HAIL	Highways Agency Information Line
HAMIS	Highways Agency Management Information System
HAPMS	Highways Agency Pavement Management System
HA RDI	
Guidance	Highways Agency Road Death Investigation Guidance
HAST	Highways Agency Pavement Management System Support Team
HATMS	Highways Agency Traffic Management Systems
HATO	Highways Agency Traffic Officer
HAUC	Highway Authorities and Joint Utilities Committee
HDA	Heavy Duty Alloy
HGV	Heavy Goods Vehicle
HRM	High Speed Road Monitor
HSC	Health and Safety Commission
HSE	Health & Safety Executive
HSWA	Health & Safety at Work Act
ICF	Investment Control Framework
IPV	Impact Protection Vehicle
IAN	Interim Advice Note
ID	Identification Number
ILE	Institution of Lighting Engineers
IMT	Incident Management Team
IPV	Impact Protection Vehicles
IRRRS	Interim Requirements for Road Restraint Systems (Vehicle & Pedestrian)
ISBN	International Standard Book Number
ISDN	Integrated Services Digital Network
ISU	Incident Support Unit
IT	Information Technology
KCI	Key Contract Indicators
KPI	Key Performance Indicators

Introduction

Acronym

LA	Local Authority
LHA	Local Highway Authority
LNMS	Local Network Management Scheme
LOLER	Lifting Operations & Lifting Equipment Regulations
LPG	Liquefied Petroleum Gas
LRP	Location Reference Point
LSCR	Long-Stop Condition Requirement
MA	Managing Agent
MAC	Managing Agent Contractor
MCC	Mobile Carriageway Closure
MCDHW	Manual of Contract Documents for Highway Works
MHSWR	The Management of Health and Safety at Work Regulations
MIC	Monthly Inspection Checklist
MIDAS	Motorway Incident Detection and Automatic Signalling
MP	Major Projects
MPD	Mean Depth Profile
MPML	Management Plan Monitoring Line
MSP	Machine Survey Pre-processor
MSU	Ministerial Submission Unit
NAM	Network Access Manager
NAR	Network Access & Resilience Team
NCC	Service Provider's Network Control Centre
NDR	Network Data Repository
NetServ	Network Services
NFG	Notes for Guidance
NGF	National Guidance Framework
NGR	National Grid Reference
NGSHW	Notes for Guidance on the Specification for Highway Works
NHS	National Health Service
NIS	Network Information System
NILO	National Incident Liaison Officer
NJUG	National Joint Utilities Group
NMA	Network Management Agent
NMCS	National Motorway Communication System
NMM	Network Management Manual
NO	Network Operations (replaces Traffic Operations)
NOG	Network Operations Group
NOM	Network Operations Manager
NPM	Network Performance Manager
NRM	Network Referencing Manager
NRMCS	National Road Maintenance Condition Survey
NRT	Network Resilience Team
NRTS	National Roads Telecommunications Services
NRSWA	New Roads & Street Works Act
NS	Network Strategy
NSN	Network Security Notes
NTO	Night Time Only Working

Introduction

Acronym

NTCC	National Traffic Control Centre
NUNS	New User Name System
NVQ	National Vocational Qualification
NVS	Network Visual Survey
OECD	Organisation for Economic Co-operation and Development
OIC	Officer In Charge
OLA	Occupiers Liability Act
OSGR	Ordnance Survey Grid Reference
O&M	Operation & Maintenance
PAR	Project Appraisal Report
PFI	Private Finance Initiative
PIN	Project Identification Number
PI	Principal Inspection
PM	Project Manager
POPE	Post Opening Project Evaluation
PPE	Personal Protective Equipment
PQ	Parliamentary Question
PS	Project Sponsor
PSA	Public Service Agreement
PPOWER	Provision and Use of Work Equipment Regulations
PVS-f	Pavement Visual Survey – flexible
QA	Quality Assurance
QRC	Quarterly Review Checklist
RCC	Regional Control Centre
RCD	Raw Condition Data
RD	Regional Director
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
RIF	Roads Information Framework
RIU	Regional Intelligence Unit
RNAR	Regional Network Access & Resilience
ROB	Regional Operations Board
RPPT	Regional Planning & Performance Team
RRS	Road Restraint System
RST	Road Surface Temperature
RTC	Road Traffic Collision
RWIS	Road Weather Information System
R&WSC	Routine & Winter Service Code
SAG	Safety Advisory Group
SCRIM	Sideway-force Coefficient Routine Investigation Machine
SCG	Strategic Co-ordinating Group
SCSR	Safety Committees and Safety Representatives Regulations
SDP	Service Delivery Points
SfM	System for Management
SIS	Standards Improvement System
SM	Service Manager
SMIS	Structures Management Information System
SMTD	Sensor Measured Texture Depth

Introduction

Acronym

SO	Special Order
SP	Service Provider
SRT	Skid Resistance
SRW	Scheduled Road works
SSR	Network Services – NetServ (replaces Safety Standards and Research)
SSSI	Site of Special Scientific Interest
STATS19	Statistics on Personal Injury Road Accidents
STGO	The Road Vehicles (Authorisation of Special Types) General Order Regulations
SVB	Solid Vertical Barrier
SWEEP	System for the Whole-life Economic Evaluation of Pavements
SWL	Safe Working Load
TASCAR	Temporary Automatic Speed Cameras at Road works
TechMAC	Technology Managing Agent Contractor
TCC	Traffic Control Centre
TIM	Traffic Incident Management
TIML	TIM Lesson Learning Workstream Leader
TiS	Traffic Information Services
TMC	Term Maintenance Contractor
TMSRW	Traffic Management and Safety at Road works team
TMU	Traffic Monitoring Unit
TO	Network Operations - NO (replaces Traffic Operations)
TOAS	Traffic Operations Actions Spreadsheet
TOCCA	Traffic Operations Contract Compliance Audit
TOS	Traffic Officer Service
TPC	Third Party Claims team
TPI	Targeted Programme of Improvements
TPO	Tree Preservation Order
TRACS	Traffic-speed Condition Surveys
TRL	Transport Research Laboratory
TRMM	Trunk Road Maintenance Manual
TSC	Thin Surface Course
TSM	Traffic Signs Manual
TSRGD	Traffic Signs Regulations and General Directions
TSM	Traffic Signs Manual
TTRO	Temporary Traffic Regulation Orders
UKAS	United Kingdom Accreditation Scheme
VAC	Video Access Control
VCS	Visual Condition Survey
VM	Value Management
VMS	Variable Message Sign
VRN	Vehicle Registration Number
WEBDAS	Web-based Departures Approval System
WMO	Winter Maintenance Officer
WRC	Water Research Council
WRF1	Winter Maintenance Reporting System
WS	Winter Service
XSP	Cross Section Position

Departures from Standard

All departures from standard must be submitted through the Highways Agency's WebDAS system. Users must have a New User Name System (NUNS) account and need to request either read only, create or reviewer levels of access from the WebDAS team as appropriate.

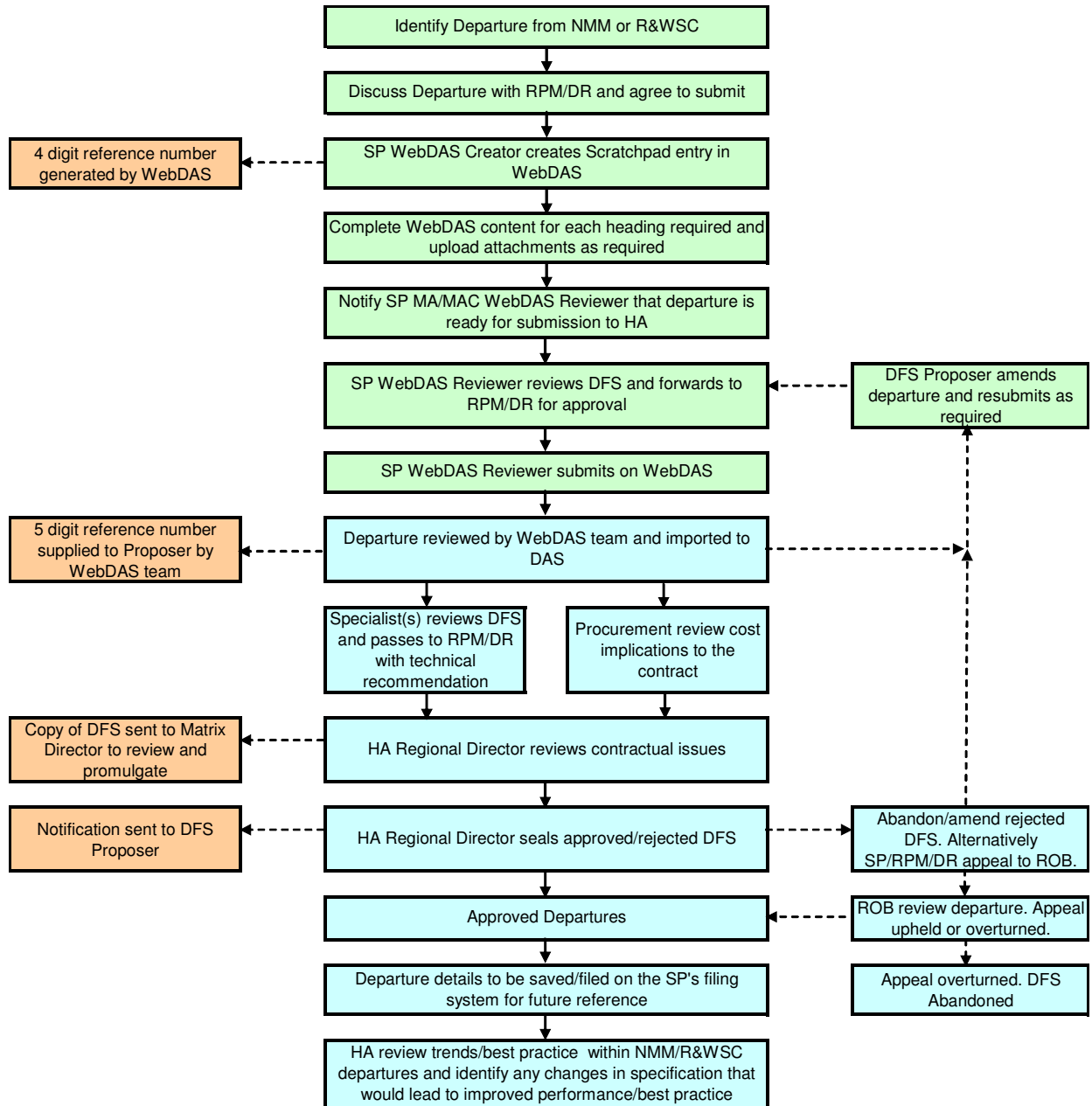
WebDAS can be accessed using the following link: <http://10.222.254.102/login.aspx> The WebDAS team can be contacted as follows: email: WebDAS@highways.gsi.gov.uk Tel: 01234 796624 or 01234 796658.

Departures must be submitted in accordance with the latest version of the Departures Submission Guidance which can be downloaded from the WebDAS website.

When prompted to enter the Project Sponsor's name for the departure, the corresponding Route Performance Manager must be entered for the route for which the departure is requested.

Departures typically take 6-8 weeks to process (without guarantee of approval). The process is outlined in the following flowchart.

Introduction



Definitions

DFS = Departure from Standard
 WebDAS = Web-based Departures Approval System
 SP = Service Provider
 RPM = Route Performance Manager
 DR = Divisional Representative
 ROB = Regional Operations Board

Key

Input required by SP
 Input required by HA
 Output

(viii) History - Origin of Chapters

TRMM Volume 1		
Chapter	Title	Comment
1.1	Chapter 8 and Safety at Road works	Included - Chapter 4.1
1.2	Optimising traffic management at road works	Included - Chapter 6.1
1.3	Light vehicle recovery at road works	Included - Chapter 4.3
1.4	Provision of speed cameras at road works	Included - Chapter 4.4
2.1	Introduction to NIS	EXCLUDED - Obsolete
2.2	Access via NIS terminals	EXCLUDED - Obsolete
2.3	NIS referencing system	EXCLUDED - Obsolete
2.4	CHART network records	EXCLUDED - Superseded by AMM37
2.5	CHART network maintenance procedures	EXCLUDED - Superseded by AMM37
2.6	NIS Site Data Collection Systems	EXCLUDED - Obsolete
2.7	NIS IHMS1 (TR&M Maintenance Expd.)	EXCLUDED - Obsolete
2.8	NATS Programs using access via NIS	EXCLUDED - Obsolete
2.10	IHMS2/3 (TR&M highway assessm't data)	EXCLUDED - Obsolete
3.1	Maintenance assessment surveys	EXCLUDED - Superseded by AMM37
3.2	HRM surveys	EXCLUDED - Superseded by AMM37
3.3	CHART surveys	EXCLUDED - Superseded by AMM37
3.4	VCS on concrete pavements	EXCLUDED - Superseded by AMM37
3.5	Deflectograph surveys	EXCLUDED - Superseded by AMM37
3.6	SCRIM surveys	EXCLUDED - Superseded by AMM37
4.1	Records & inspections of structures	Included - Chapter 2.12
4.2	Fifteen Year Rehab Programme	EXCLUDED – Obsolete
5.1	Financial Instructions for Local Authorities	EXCLUDED – Obsolete
5.2	Financial Instructions for Consultants	EXCLUDED – Obsolete
5.3	Claims for damage to Department's property	Included - Chapter 11.1
5.4	Tendering procedures	EXCLUDED - Obsolete
5.5	Lane rental type contracts	EXCLUDED - Obsolete
5.6	Competition in provision of LA services	EXCLUDED - Obsolete
5.7	Implementation of part III of NRSWA	EXCLUDED - Obsolete
6.1	Co-ordination of design and works	Included - Chapter 6.6
TRMM Volume 2		
Chapter	Title	Comment
1.12	Sweeping and Cleaning	Included - Chapter 3.14
TRMM Volume 3		
Chapter	Title	Comment
	Introduction	EXCLUDED - Obsolete
1.1	Health & Safety management in compounds	Rewritten – 3.19
1.2	Identification of workplace hazards	Rewritten – 3.20
1.3	CDM Regulations	Rewritten – 1.1

Introduction

Area Management Memos				
No	Title	Issued	Notes	Action
1	<i>Local Biodiversity Action Plans</i>	7/06/ 99	<i>Withdrawn</i>	
2	Temporary Direction Signing – Special Events	9/06/99		Included - in Chapter 4.2
3	Certificates of Completion	17/06/99		Highways Agency Internal circulation only
4	Computer Charges	17/06/99		Highways Agency Internal circulation only
5	NRSWA – Recovery of Inspection Fees from Statutory Undertakers	13/07/99		Included - in Chapter 6.7
6	<i>Routine Maintenance Management System</i>	24/09/ 99	<i>Withdrawn</i>	
7	<i>New Invoice Coding Requirements for Construction Industry Scheme (CIS)</i>	30/09/ 99	<i>Excluded Obsolete</i>	-
8	Application for Payment/Requests for Payment	3/11/99		Highways Agency Internal circulation only
9	Policy Statement on VMS	5/11/99		Highways Agency Internal circulation only
10	Detrunking – Transfer of Routine Maintenance Resources to LAs	5/11/99		Highways Agency Internal circulation only
11	<i>Winter Maintenance of Cycleways and Footpaths</i>	6/12/99	<i>Withdrawn</i>	
12	<i>Financial Year End Payment</i>	7/02/00	<i>Withdrawn</i>	
13	<i>Special Inspection of Pre- 1986 Road Studs</i>	17/02/00	<i>Withdrawn</i>	
14	Advice on Environmental Implications of Maintenance Operations	1/03/00		Included - in Chapter 3.18
15	<i>Detrunking/Virtual Detrunking Guidance</i>	31/03/00	<i>Replaced by No.20</i>	
16	<i>Environment Database – Data Collection Requirements</i>	20/06/00	<i>Superseded by DMRB Vol 10, Section 0</i>	
17	<i>Winter Maintenance in Low Humidity Weather Conditions</i>	26/09/00	<i>Replaced by No. 27</i>	
18	<i>RMMS – Amendment Set V111 Updates</i>	13/12/00	<i>Withdrawn</i>	
19	Decriminalised Parking	26/01/01		Included - in Chapter 6.4
20	<i>Detrunking/Virtual Detrunking Guidance</i>	13/02/01	<i>Replaced No.15</i>	
21	<i>Non-Motorised User Crossing Surveys</i>	5/03/01	<i>To be withdrawn</i>	
22	<i>Programme Development</i>	6/03/01	<i>Replaced by No.29</i>	
23	<i>Continuous Value Management</i>	18/04/ 01	<i>Replaced by No. 30</i>	
24	<i>Continuous Value Management</i>	10/05/01	<i>Replaced by No. 31</i>	

Introduction

Area Management Memos				
No	Title	Issued	Notes	Action
25	De-Trunking- Transfer of Records	18/06/01		Highways Agency Internal circulation only
26	Reduction in Salt Grain Size	28/09/01		Review data from RWSC now inc in NMM
27	Revised Winter Maintenance in Low Humidity Weather Conditions	28/09/01		Review data from RWSC now inc in NMM
28	<i>Changes to TRMM Vol 1 to update advice on use of HAPMS applications for the maintenance of Trunk Roads</i>	21/02/02	Replaced by No. 37	
29	<i>Programme Development Programme Objectives Guidance</i>	27/03/ 02	Replaced No 22 Replaced By No 32	
30	<i>Programme Development Guidance</i>	27/03/02	Replaced No 23 Replaced by No 38	
31	<i>Value Management – Maintenance & Making Better Use Projects</i>	27/03/02	Replaced No 24 Replaced by No 33	
32	<i>Programme Development Programme Objectives Guide</i>	10/04/02	Replaced No 29 Replaced by No 38	
33	<i>Value Management – Maintenance & Making Better Use Projects</i>	16/04/02	Replaced No. 31. Replaced by No 38	
34	Winter Maintenance in Low Temps Combined with Low Humidity Conditions	19/09/02		Review data from RWSC now inc in NMM
35	De-Icing & Snow Clearance within Traffic Calmed Areas	19/09/02		Review data from RWSC now inc in NMM
36	Winter Maintenance of Thin Wearing Courses	14/11/02		Review data from RWSC now inc in NMM
37	<i>Changes to TRMM Vol 1 to update advice on use of HAPMS applications for maintenance of trunk roads.</i>	17/01/03	Replaced No 46	
38	<i>Programme Development</i>	17/03/03	Replaced by No 44	
39	Incident Support Units	28/04/03		Included - in Part 7
40	<i>Control of Ragwort & other injurious weeds</i>	15/07/03	Replaced by No 48	
41	Winter maintenance operations	13/08/03		Included –in Chapter 5
42	<i>Winter service for footways & cycleways</i>	15/10/03	Replaced by No 50	

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Area Management Memos				
No	Title	Issued	Notes	Action
43	Prioritisation of noise mitigation sites	18/12/03	Replaces CHE 72/99	Not included
44	<i>Programme Development</i>	18/03/04	<i>Replaces No 38</i>	<i>No longer included (Ch 7)</i>
45	Waste Management - Landfill Directive & Liquid Waste	28/04/04		Included – in Chapter 3.17
46	Changes to TRMM Vol 1 to update advice on use of HAPMS applications for maintenance of trunk roads.	30/04/04	Replaces No 37	Included - in Chapters 6.2, 2.1-2.11
47	Value Management Guidance for Small Works and Non-pavement Renewals	06/05/04	Addendum to No 44	Not included (see No 44)
48	Control of Ragwort and Injurious Weeds	16/06/04	Replaces No 40	Included - in Chapter 3.13
49	Winter Service Plan Template	03/08/04		Included – in Chapter 5.2
50	<i>Winter Service for Footways & Cycletracks</i>	03/08/04	<i>Replaced by No.61</i>	
51	Provision of Mutual Aid Arrangements	03/08/04		Included – in Chapter 5.4
52	Use of cones at damaged safety fence	19/11/04		Included – in Chapter 3.7
53	<i>Withdrawn – replaced by 55/04</i>	15/10/04	<i>Replaced by No 55</i>	
54	Critical Incident Reporting	26/10/04		Not included – advice of tel. number only
55	<i>Winter Notification & Reporting Arrangements 2004/05</i>	26/11/04	<i>Replaced by No.65</i>	
56	Inspection of Utility Works Under New Roads & Streetworks Act	05/01/05		Included – in Chapter 6.7
57	Post Incident De-brief Arrangements Guidance Document	05/01/05		Included – in Part 7
58	Network Information Exchange with the National Traffic Control Centre	20/01/05		Included – in Chapter 6.2
59	<i>Forward Programming Guidance</i>	08/04/05	<i>Replaces No 44 Replaced by No 72</i>	<i>No longer included (Ch 7)</i>
60	Prevention of Objects falling from Highways Agency Structures	16/05/05		Included – in Chapter 1.3.1 & 1.4
61	<i>Winter Service Plan Template</i>	26/05/05	<i>Replaced by No.74</i>	
62	Dealing with Freezing Rain	02/08/05		Included – in Chapter 5.7
63	<i>Salt Stock Level Monitoring</i>	02/08/05	<i>Replaced by No.76</i>	<i>Included – in Chapter 5.1</i>
64	Dealing with Fluid & Gas Build-up in Heavy Duty Alloy Aluminium Parapets	05/09/05		Included – in Chapters 3.5 & 3.7
65	Winter Notification & Reporting Arrangements 2005/06	01/10/05	Replaces No.55	Included – in Chapters 5.2 & 5.5
66	Maintenance Responsibilities in relation to the NTCC	01/10/05		Included – in Chapter 3.8.3

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Area Management Memos				
No	Title	Issued	Notes	Action
67	Managing & Identifying Canine Fatalities	18/11/05	Re-issued 18/01/08	Included – in Chapter 7.17
68	Lane Restrictions at Barrier Repairs	10/01/06		Included – in Chapter 3.7
69	Policy on Snow Plough Height Settings	20/02/06		Included – in Chapter 5.7
70	Post-Incident Cold Debrief Process	18/05/06		Included – in Part 7
71	Off Network Tactical Diversion Routes	02/06/06		Included – in Chapter 7.6.4
72	Forward Planning Guidance	08/06/06	Replaces No 59	Included – in Chapter 10.1
73	Sequentially Flashing Danger Lamps	14/06/06		Included – in Chapter 4.1
74	<i>Winter Service Plan Template</i>	<i>03/07/06</i>	<i>Replaced by 88</i>	
75	<i>Winter Briefings for Traffic Officers</i>	<i>06/09/06</i>	<i>Replaced by 90</i>	
76	Strategic Salt Stock Monitoring	06/09/06	Replaces No.63	Included – in Chapter 5.1
77	<i>Winter & Business Continuity Reporting Arrangements 06/07</i>	<i>25/09/06</i>	<i>Replaced by 91</i>	
78	Disability Discrimination Act: Audit of the Network	16/10/06		Not included
79	Roadworks Safety Camera Costs – April 07 onwards	24/11/06		Included – in Chapter 4.4
80	Prevention of objects being thrown at traffic	11/12/06		Included – in Chapter 3.5
81	Development of Reserve Winter Fleet	12/12/06	Replaces Annex A.16 of Winter Service Plan	Included – in Chapter Annex 5.2.1
82	Use of speed and red-light cameras for traffic enforcement: Guidance on deployment, visibility and signing	01/03/07		Included – in Chapter 4.4
83	Network Occupancy Management Process	09/03/07		Included – in Chapter 6.1
84	Mitigating Delays arising from Street Works	09/03/07		Included – in Chapter 6.1.9
85	Design and Installation of the HA's Transmission Networks by the National Roads Telecommunications Service Contractor	23/04/07		Included – in Chapter 3.8
86	Service Provider Contingency Planning Template & Guidance	24/04/07		Included – in Chapter 7.6
87	Wider Road Safety Partnership Guidance	24/04/07		Included – in Chapter 4.4
88	Winter Service Plan Template - 2007/08	10/07/07	<i>Replaces No. 74 Replaced by 101</i>	
89	Snow Clearance Adjacent to Solid Vertical Barriers	10/07/07		Included – in Chapter 5.7

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Area Management Memos				
No	Title	Issued	Notes	Action
90	Winter Service Briefings for the Traffic Officer Service	10/07/07	<i>Replaces No. 75 Replaced by 102</i>	
91	Winter and Business Continuity Reporting Arrangements	10/07/07	Replaces No. 77	Included – in Chapter 5.1
92	Network Occupancy Management – Supplementary Instruction	10/07/07	Supplement to No. 83	Included – in Chapter 6.1
93	Salt Loading Hoppers	18/07/07	Instructed one off emergency measures	Not included
94	Emergency Customer Welfare (ECW)	01/10/07		Included – in Chapter 7.1
95	Rapid Re-opening of Running Lanes Following Diesel and other Hydrocarbon Spillages	04/12/07		Included – in Chapter 7.18
96	The Reporting of Supply Chain Incidents	18/01/08	Re-iterates requirements at Chapter 1.5	Not included
97	Gathering Of Summary Supply Chain Incident Data	28/03/08	<i>Replaced by No. 105</i>	
98	Road Safety Data Types and their Uses	28/03/08	<i>Replaced by No. 107</i>	
99	Use of non-standard CCTV	14/05/08		Included - in Chapter 7.19
100	Review of the implementation of Geotechnical Asset Management requirements and the production of Geotechnical Asset Management Plans	21/05/08		Included - in Chapter 3.4
101	Severe Weather Plan Template 2008/9	17/06/08	<i>Replaces No. 88 Replaced by No. 109</i>	
102	Winter Service and Severe Weather Briefings for the Traffic Officer Service	17/06/08	Replaces No. 90	Included - in Chapter 5.1.4
103	Snow Desk Exercises – 2008/09	03/07/08		Not included
104	The Management of Sub-Standard, Concrete Half Joint and Hinge Deck Structures	21/07/08		Included – In Chapter 3.5
105	The Reporting of Supply Chain Accidents	10/10/08	Replaces No. 97	Included - in Chapter 1.6
106	Abnormal Indivisible Loads (AIL) Special Order (SO) Process Improvements	22/10/08		Included - in Chapter 6.5
107	Road Safety Data Types and their Uses	09/02/09	Replaces No. 98	Included – in Chapter 11.6
108	Interim Update of the March 2007 Value Management Guidance for LNMS	24/04/09		Included - in Chapter 10.2.5
109	Severe Weather Plan Template – 2009/10	26/06/09	Replaces No. 101	Included - in Chapter 5

Introduction

Network Security Notes				
No	Title	Issued	Notes	Action
1	Introduction of NSN System	from 1997	<i>Replaced by NSN 9 -18</i>	
2	Identification of "Key Targets"			
3	RNCS Response to Incidents			
4	Making Contact with the Police			
5	Security at Works Sites			
6	Procedure to Follow if You Receive a Bomb Threat by Phone			
7	Communications During Security Alerts			
8	unpublished			
9	Network Security Notes	06/12/02	<i>Superseded by contingency planning arrangements</i>	Included - in Chapter 9.1
10	Definition of a major incident	06/12/02		
11	Role and Responsibilities of the Highways Agency in Emergency Planning	06/12/02		
12	Role and Responsibilities of others in Emergency Planning	06/12/02		Included - in Chapter 9.2
13	How major incidents are managed	06/12/02		
14	The response of the Highways Agency	06/12/02		Included - in Chapter 9.3
15	Information and the media	06/12/02		
16	Contingency planning – the principles	06/12/02		
17	Contingency planning – preparing a plan	06/12/02		
18	Emergency planning exercises	06/12/02		

(ix) Enquiries

Enquiries and comments regarding the subject matter of the Network Management Manual should be made to:

Highways Agency
 Network Services, Network Management Policy Team
 City Tower
 Piccadilly Plaza
 MANCHESTER M1 4BE

(Telephone 0161 930 5738)

PART 9 – INTENTIONALLY BLANK

CONTENTS

Chapter

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PART 8 - BETTER INFORMATION FOR ROAD USERS

CONTENTS

Chapter		Page No.
8.1	General	8.1-1
	8.1.1	Introduction
	8.1.2	Information to Road Users Toolkit

8.1 General

8.1.1 Introduction

The Highways Agency Corporate Plan 'Customers First'¹ sets out the Highways Agency's vision for the next five years and beyond for providing a continuously improving service to all of the Highways Agency's customers. Building on this, the Highways Agency Information Strategy 'Changing the customer experience through information' includes a strand "To deliver efficient, effective, reliable and robust information systems and services support to our customers, staff and stakeholders." The Highways Agency is committed to providing our customers with reliable, useful and effective information. Service Providers are required to assist in this through considering information needs, particularly during the design and construction of road works, with particular reference to the existing technical infrastructure including loops, ANPR cameras, CCTV and VMS.

8.1.2 Information to Road Users Toolkit

The Highways Agency and its Service Providers have a number of means open to them to deliver information to road users, operational partners, and other stakeholders. The Highways Agency is intending to develop a Toolkit to prompt and facilitate Service Providers and Highways Agency staff in their consideration of communication plans for any specific planned activities including road works and special events, and longer term needs following construction. This Toolkit will be developed by Information Directorate in consultation with Traffic Operations and Major Projects Directorates. Examples of the tools available as appropriate for such purposes are:

- Variable message signs (static and mobile)
- Static signs
- Internet web sites
- Automated telephone service
- Temporary and permanent CCTV camera provision
- Temporary and permanent traffic monitoring infrastructure
- Use of the HAIL service
- Broadcast media
- Dissemination of information through private sector information providers
- Dissemination of information through Highways Agency operational partners
- Publications

Pending development of the Toolkit, Service Providers are required to consult with Area Performance / Route Performance Managers in the first instance. Onward referral to Information Directorate may be appropriate.

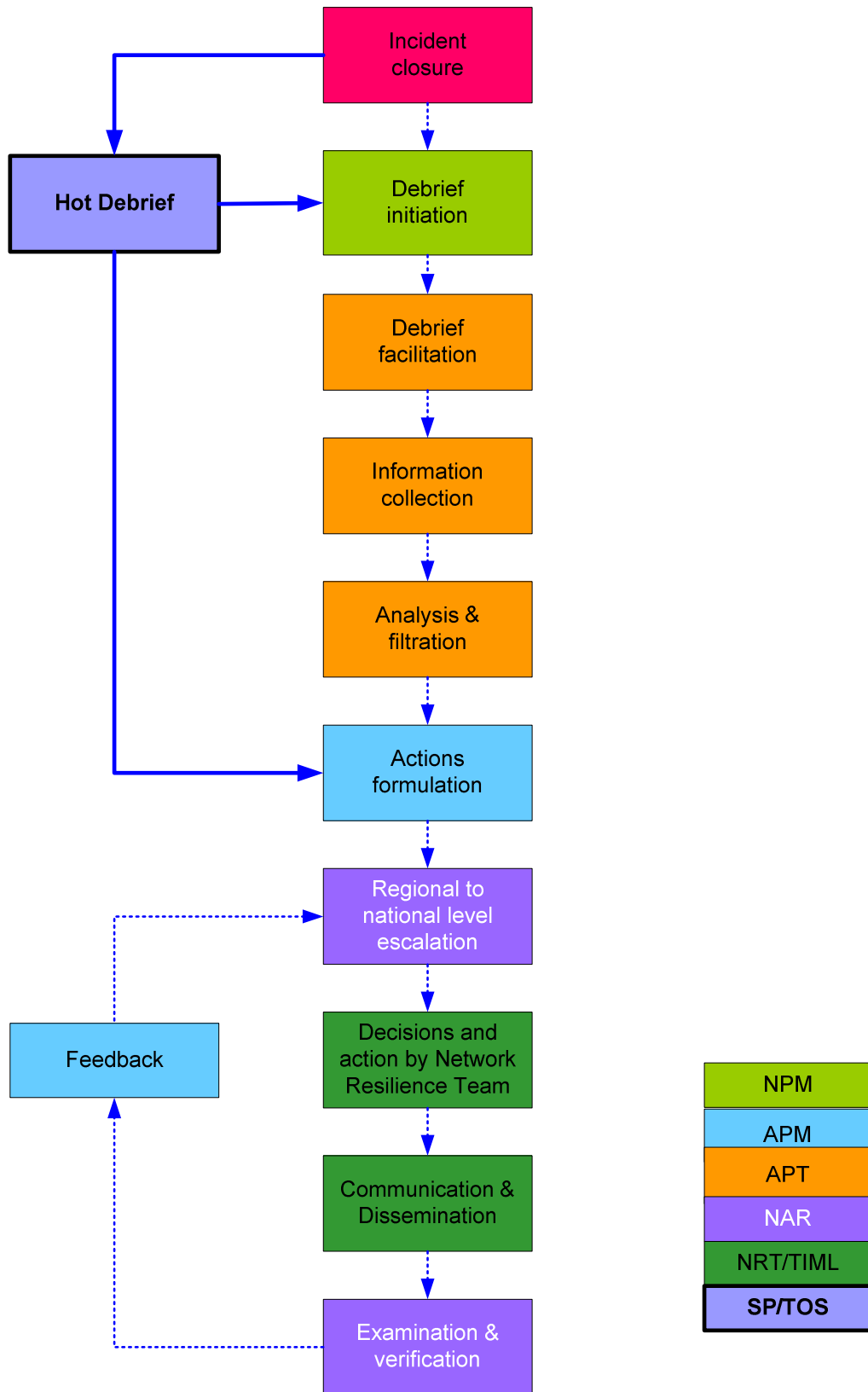
For further information or help please contact: Gary Stockbridge of Information Directorate Customer Relationship Group Tel: 0121 687 4212 or e-mail: gary.stockbridge@highways.gsi.gov.uk.

References

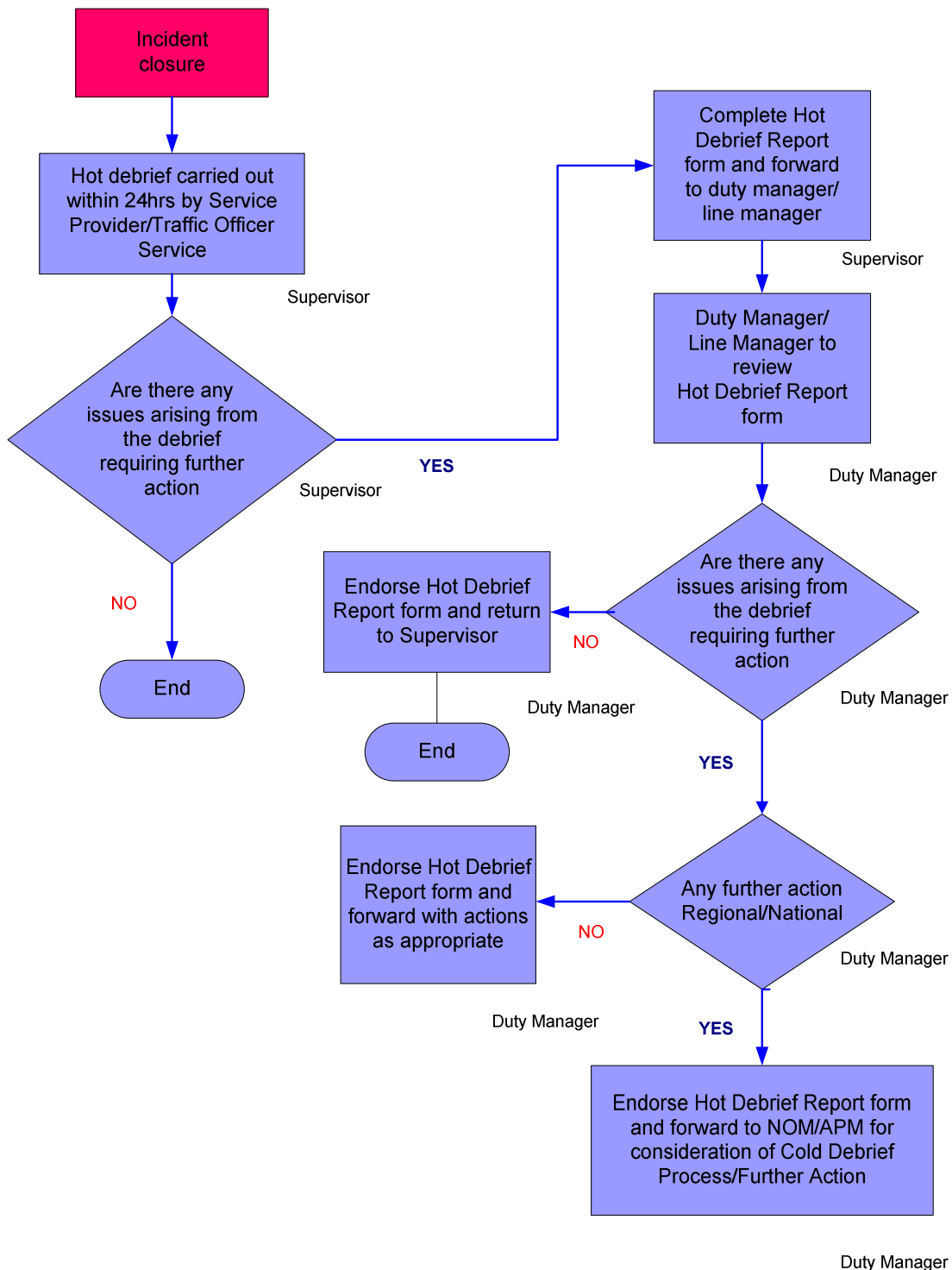
¹The Highways Agency's Corporate Plan was published on 31 January 2005 and is available the Highways Agency website

²The Highways Agency's Information Strategy 'Changing the customer experience through information' was published on 30 March 2006 and is also available on the website.

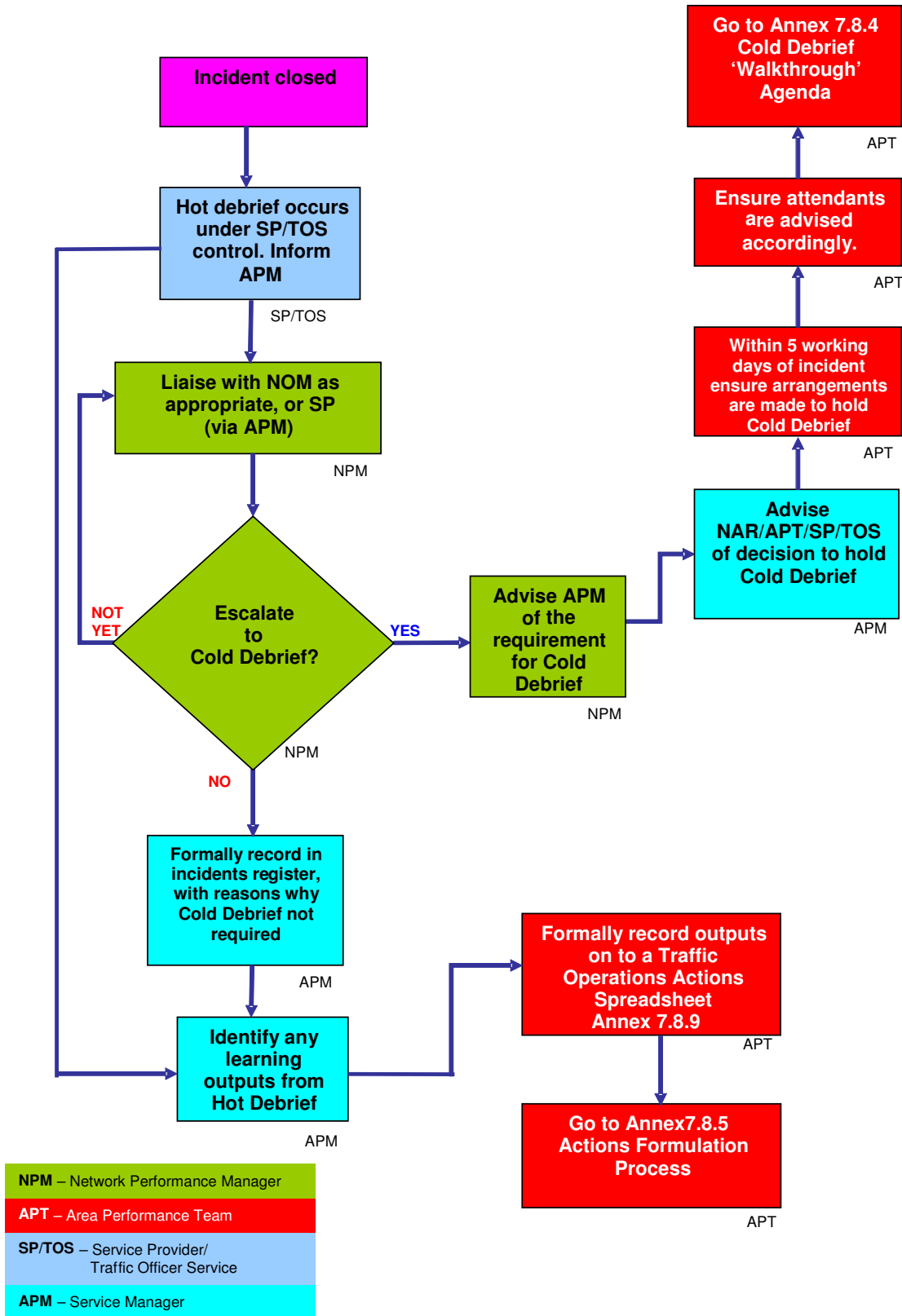
Annex 7.8.1 Framework for debriefs



Annex 7.8.2 Hot debrief process



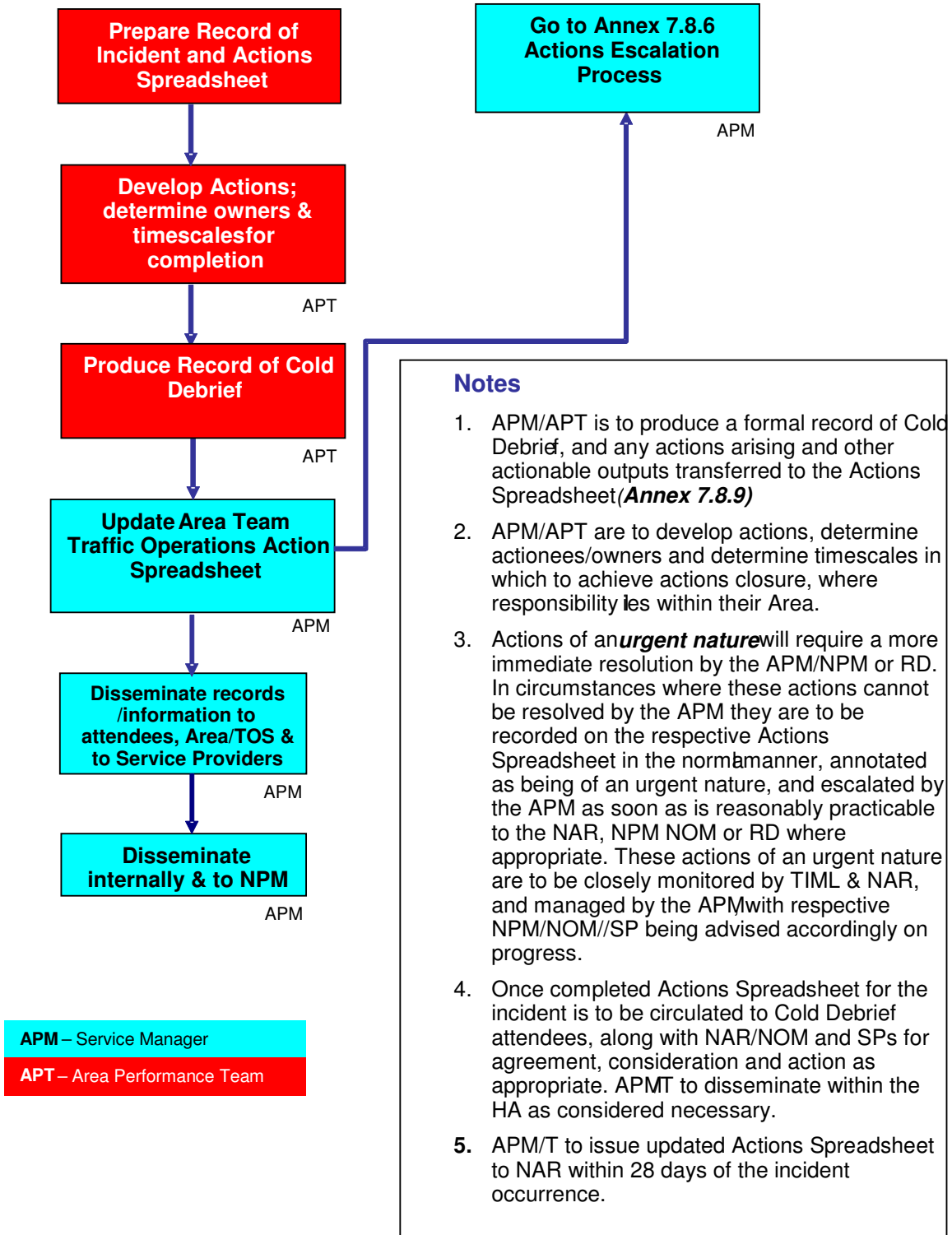
Annex 7.8.3 Cold debrief initiation process



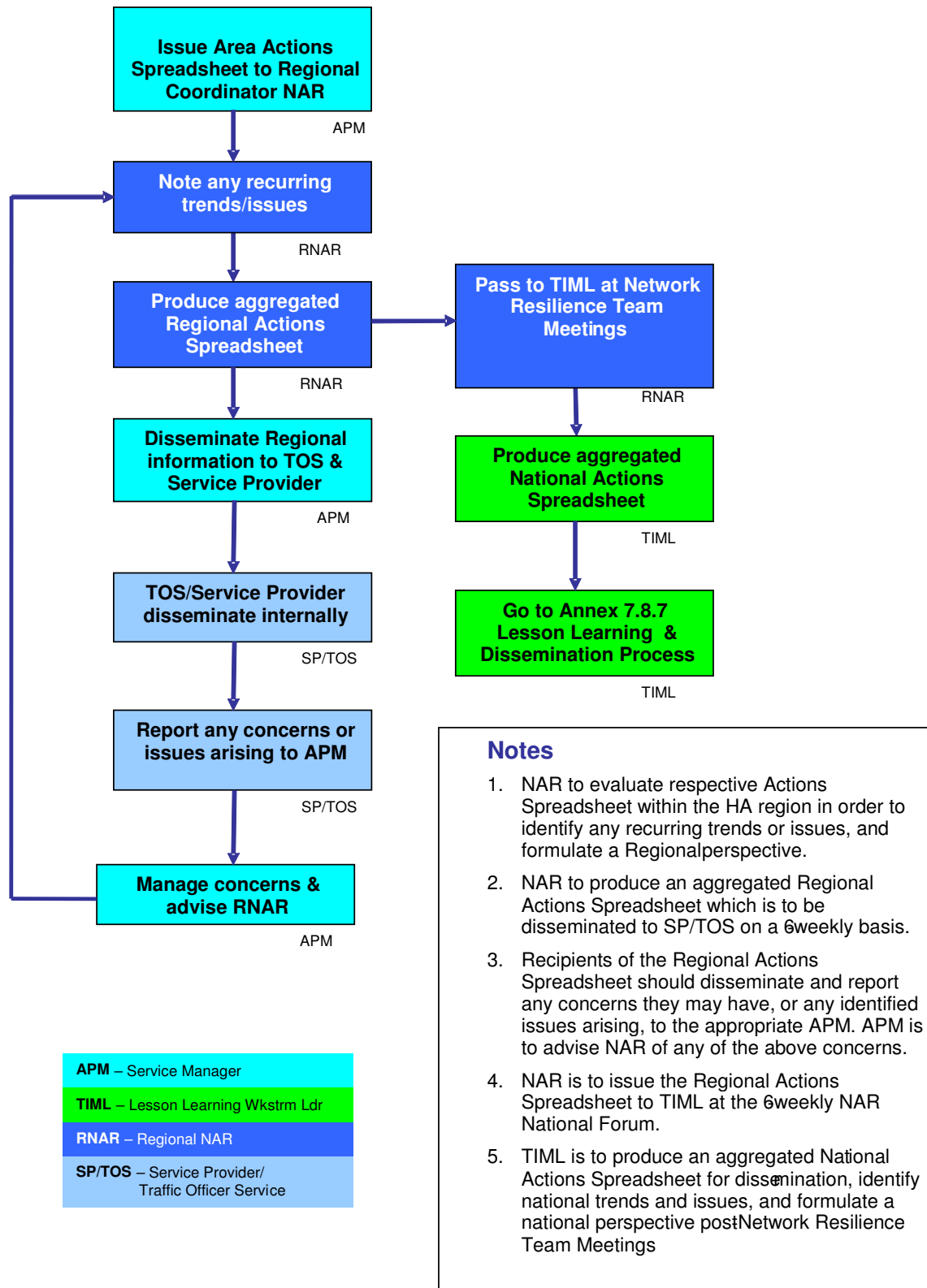
Annex 7.8.4 Incident cold debrief 'walkthrough' agenda

Serial	Action	Comments
1	Introductions	Personalities/stakeholders
2	Objective(s)	
	Incident Details	<ul style="list-style-type: none"> • Description • Location – e.g. Ordnance Survey, lane(s) • Date & time – dd/mm/yy, 24 hour clock
3	Walkthrough incident with timelines	<ul style="list-style-type: none"> • Incident detection (How/when?) • Incident verification (How/when?) • Incident response (How/when?) • Recovery & repair (How/when?) • Restoration (How/when?) • Other relevant inclusions
4	Review/discuss individual organisation incident logs	Agree sequence of events in chronological order
5	Formulate consolidated incident log plotted against timeline	Period from incident notification through to incident site clearance
6	Identify any problems experienced, or issues identified, by any organisation, & cause(s)	Gather all information needed to draft Incident Report and enter actions onto Actions Spreadsheet post de brief. Consider
7	Identify things that went well, any Lessons to be learned, good and bad practice and lessons and agree actions, owners and timescale	<ul style="list-style-type: none"> • Communications • Diversions • Resources • Sign setting
8	Identify where improvements/research/study could be made	<ul style="list-style-type: none"> • Media • Weather
9	Any additional relevant information	<ul style="list-style-type: none"> • Access • Egress • Welfare • Command & Control • Processes/Practice/Junctions/Network • Other
10	Close debrief meeting	

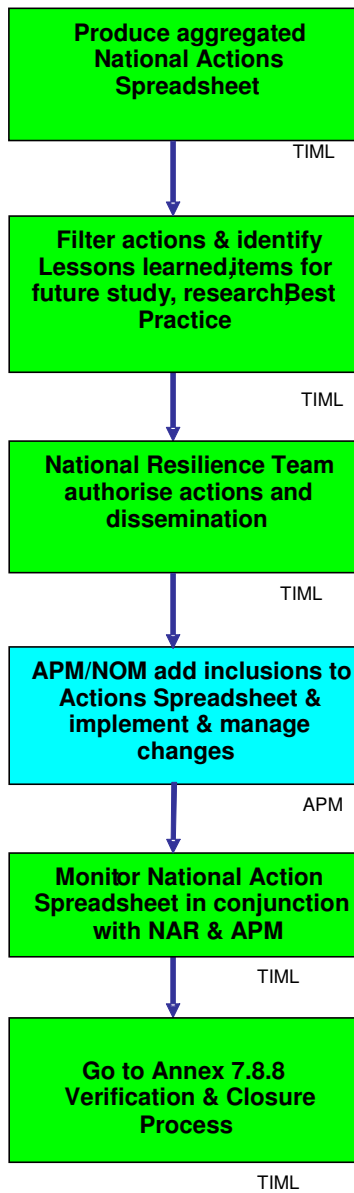
Annex 7.8.5 Actions formulation process



Annex 7.8.6 Actions escalation process



Annex 7.8.7 Lesson learning & dissemination process

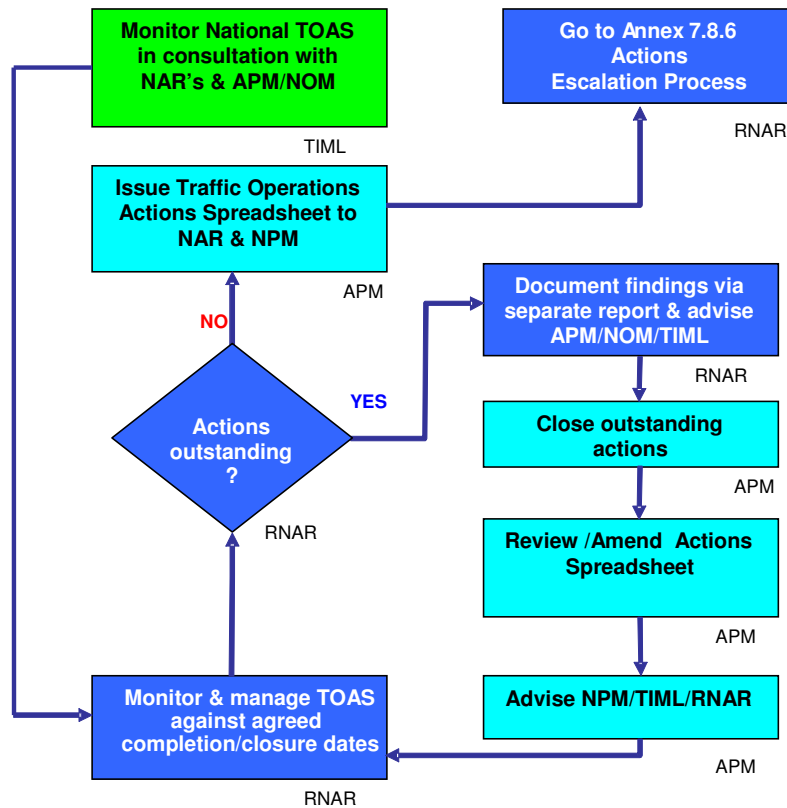


Notes

1. TIML is to review all actions and identify lessons to be learned from the aggregated National Actions Spreadsheet with the assistance of NAR's.
2. TIML is to disseminate information to TIM Programme, TIM Workstream Leaders, TIM Centre of Excellence (yet to be scoped), Regional Intelligence Units (RIU), Roads Information Framework (RIF), Traffic Information Service (TIS) and to all NAR's. They will also submit Network Resilience Team requests for actions to address identified problems to Regional or Specialist directors or TIM governance as appropriate.
3. NAR to disseminate information to APM/NOMs.
4. Network Resilience Team is to monitor Lesson Learning implementation in conjunction with NAR and APM/NOMs.

APM – Service Manager
TIML – Lesson Learning Wkstrm Ldr

Annex 7.8.8 Verification and closure process



APM – Service Manager
TIML – Lesson Learning Wkstrm Ldr
RNAR – Regional NAR

Notes

1. TIML is to monitor National Actions Spreadsheet in consultation with NAR's and APM/NOM.
2. NAR to manage actions against agreed completion/closure dates in order to verify that action closure is achieved.
3. TIML to liaise with NAR to agree any actions that are outstanding.
4. TIML/NAR to document erroneous findings via separate report, and advise respective APM.
5. APM to achieve closure of outstanding actions.
6. APM to advise NPM/NAR & TIML when actions closed out.
7. TIML/NAR to re-examine as necessary, and agree actions closed out.
8. APM to review and revise Actions Spreadsheet post - agreement on action closures.
9. APM to issue updated Actions Spreadsheet to NPM & RNAR

Annex 7.8.10 ISU Incident data capture sheet & guidance note

Service Provider Reference number:

ISU type attending: Motorcycle , Car , Van , Truck

Motorway: , **All Purpose Trunk Road:** , **Road Number:**
(For designations such as A1(M), please tick both motorway and trunk road)

Type of carriageway; S2 , D2M , D3M , D4M , **Other**

Mainline , **Entry Slip Road** , **Exit Slip Road** , **Junction no.:**

Secondary road *(number or name if appropriate):*

Direction of travel of incident: north , south , east , west
clockwise , anti-clockwise , roundabout

Is the incident in roadworks: Yes , No

Please locate the incident by at least one of the following options:

Ordnance Survey Grid Reference *(6 figure):*

Marker Post: **Emergency Roadside Telephone:**

Lamp Post Reference: **Other location:**

NOTE: PLEASE USE THE 24 HOUR CLOCK FORMAT FOR ALL TIME RECORDS

Time of incident: **Date of incident:**

Time incident reported to dispatcher: , **Time of call to dispatch ISU:**

Time ISU dispatched: **Arrival time of ISU at incident:**

Time incident cleared from running lanes (not hardshoulder):

Time ISU left site: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Other responders:	Arrival Time	Departure time
<i>Please note: You only need fill in the times appropriate e.g. if you find the incident proactively there will be no dispatch time.</i>	Traffic Officer.....	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Police.. ..	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Another ISU.....	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Motoring Service.	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

Comments:

Visibility;..... Clear , 500m to 1000m , 100m to 500m , less than 100m
(Tick as appropriate) Light , Dark, lit with streetlights , Dark, with no, or unlit,lights
Affected by low sun

Precipitation;.....None , Rain , Snow , Hailstone , Sleet

Road Conditions;...Dry , Wet , Slush , Snow covered , Icy

Wind;.....None , Light , Moderate , Severe , Gusty

Incident in Lane(s) *(tick as appropriate)* H/S , 1 , 2 , 3 , 4 , 5 , 6 , 7

Lane(s) affected *(tick as appropriate)*...H/S , 1 , 2 , 3 , 4 , 5 , 6 , 7

Effect on traffic flow in direction of incident (slow/static vehicles for):

Less than 1/2 a mile , 1/2 mile to 1 mile , 1 mile to 3 miles , great than 3 miles

Estimated time to clear slow/static vehicles in direction of incident

No time to clear , Up to 15 minutes , 15 to 60 minutes , over 1 hour

Length of queue on opposite carriageway/lane

None , less than 1 mile , 1 to 3 miles , over 3 miles , Unsure

<p>Number of cars involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of vans involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of LGV involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of HGV involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of PSV involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of cranes involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of abnormal loads involved.. <input type="checkbox"/><input type="checkbox"/></p> <p>Number of motorcycles involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of cycles involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Number of pedestrians involved..... <input type="checkbox"/><input type="checkbox"/></p> <p>Other <input style="width: 100%;" type="text"/></p>	<p>Nature of incident</p> <p>Debris <input type="checkbox"/> - go to Debris Details</p> <p>Vehicle Incident (VI) <input type="checkbox"/></p> <p style="padding-left: 20px;">- go to Type of VI</p> <p>Flood..... <input type="checkbox"/></p> <p>Subsidence. <input type="checkbox"/></p> <p>Abandoned vehicle <input type="checkbox"/></p> <p>Other <input type="checkbox"/> (state below)</p> <div style="border: 1px solid black; height: 30px; width: 100%; margin-top: 10px;"></div>
<p>Please tick here <input type="checkbox"/> if details were provided by another authority e.g. police</p> <p>Please tick here <input type="checkbox"/> if HAZCHEM is involved</p>	
<p>Debris Details HGV/LGV strap <input type="checkbox"/>, HGV/LGV tyre <input type="checkbox"/>, HGV/LGV lorry part <input type="checkbox"/></p> <p><i>Please describe the item in the Comments box.</i> car tyre <input type="checkbox"/>, car part <input type="checkbox"/>, wood <input type="checkbox"/>, dead animal <input type="checkbox"/>, mud <input type="checkbox"/></p> <p>burnt out vehicle <input type="checkbox"/>, Fuel spill <input type="checkbox"/>, Other <input type="checkbox"/> (state below)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Comments:</p> </div>	
<p>Type of VI Collision <input type="checkbox"/>, fire <input type="checkbox"/>, breakdown <input type="checkbox"/>, other <input type="checkbox"/> (state below)</p> <p>Cause (if known) Mechanical failure <input type="checkbox"/>, road conditions <input type="checkbox"/>, abnormal load <input type="checkbox"/></p> <p>apparent over height/weight/length vehicle <input type="checkbox"/> Other <input type="checkbox"/> (state below)</p> <div style="border: 1px solid black; height: 30px; width: 100%; margin-top: 10px;"></div> <p>Was the network damaged:..Yes <input type="checkbox"/>, No <input type="checkbox"/> (If yes please tick appropriate boxes below)</p> <p>safety barrier <input type="checkbox"/>, surfacing <input type="checkbox"/>, structure <input type="checkbox"/>, lighting column <input type="checkbox"/></p> <p>cabinet <input type="checkbox"/>, signals <input type="checkbox"/>, signage <input type="checkbox"/>, emergency roadside telephone <input type="checkbox"/></p> <p>Fence <input type="checkbox"/>, Other <input type="checkbox"/> (please state below)</p> <div style="border: 1px solid black; height: 40px; width: 100%; margin-top: 10px;"></div>	

**GUIDANCE NOTE FOR COMPLETION OF INCIDENT SUPPORT UNIT (ISU)
INCIDENT DATA CAPTURE SHEET (Version 1.0)****1. Introduction**

This guidance describe the information to be recorded concerning incidents attended by ISUs on the Highways Agency strategic road network and the accompanying Incident Support Unit (ISU)- Incident Data Capture Sheet (IDCS) must be completed.

The information collected on the IDCS is designed to aid consideration and development of current and future practices and methodologies for dealing with incidents.

The collection of information on an ISU's day-in-day-out involvement with incidents will allow a fuller understanding and appreciation of the magnitude of incident management. It is therefore highly important that the IDCS be completed and submitted as stated in **3. Reporting and Performance Monitoring** of this Guidance.

2. General

It is recognised that ISUs are not always the first attendee to an incident. In these circumstances the ISU must record the information they are aware of. This means that only those facts that are known to the ISU, or can be accurately provided by others, for example from the other attendee(s) or the Regional Control Centre (RCC) or Network Control Centre (NCC), can be recorded. Where information cannot be obtained, the appropriate boxes should be left blank and comment made in the comments box where appropriate.

Some ISUs may also be called to attend an incident by another ISU crew to provide assistance or address specialist roles. In these situations the action of the second ISU must be recorded as if they were attending an incident. Therefore the RCC reference and the time of the incident must be obtained from the first ISU and the rest of the document filled in as if it was a separate call out.

The data captured may be available under Freedom of Information.

3. Reporting and Performance Monitoring

The ISU-IDCS must be completed for every incident at the time of the incident.

Each month the completed ISU-IDCSs must be submitted to the HA in an electronic comma separated value (CSV) format. Please note that the tilde (~) character must be used as the delimiter for the attributes, which are described in **5. ISU Data Attributes**.

The data must be virus checked and sent by e-mail to the following address on the last working day of every month: ISU-IDCS@Highways.GSI.Gov.UK

The e-mail subject description must be the name of the attached file. Note that if a file exceeds 5Mb then it must be divided into smaller files (ensuring that incident data records are not split) and each file e-mailed separately to the HA.

The body of the e-mail must contain the following transmission details:

- Originating Organisation
- Contact Name
- Contact Telephone Number

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- Date virus check carried out

The naming of the data files must follow the convention set out below:

ISU_IDCS_<Supplier Identifier>_<Date>_<Number>_OF_<Total>.CSV

<Supplier Identifier>	This identifier will be supplied by the HA – contact the Agency’s IT help/service desk facility known as Service Direct (0113 2541140)
<Date>	The Date that the file is submitted. This must be in the format YYYYMMDD
<Number>	The sequential part number of the submission
<Total>	The total number of parts comprising the submission

An example of such a file name would be: ISU-IDCS_MAC16_2006-08-07_1_OF_1.CSV

The HA must process the data and provide an automated response indicating whether the data was successfully loaded. If the response indicates that the processing was unsuccessful then contact Service Direct as soon as possible.

4. Completing the ISU Data Capture Sheet

The IDCS is split in to seven separate boxed sections. Each section deals with a different aspect of an incident. The first five sections must be filled in as completely as possible. The two remaining sections are completed depending on Section 5.

Section 1

The first section of the data sheet is mainly concerned with recording the location of the incident. This section must be fully completed. The information required should be readily available or known to the ISU operatives.

After completing the Service Provider Incident Reference number and type of ISU attending, the section asks for the road the incident is on and to identify if it is motorway or trunk road. When dealing with road designations such as A1(M), both motorway and trunk road boxes must be ticked. If the road has a standard motorway or trunk road designation, only one of these boxes must be ticked.

The secondary road of an incident refers to incidents that occur at junctions. If the incident happened on a HA road at a junction, this is the primary road and will already have been filled in earlier in this section. The secondary road is then the name of the other road at the junction. Where there are more than two roads at a junction, the first is always a HA road and the second must always be the next major road or the one from which any car involved in the incident came from if this can be positively determined and is one of those at the junction in question. Should the incident have started on a non-HA road and come to be on a HA road, either as a consequence of skidding or being shunted/falling on to it, the primary road must always be the HA road. The secondary road would be the one where the incident originated, leading to the effect on the HA network.

The direction of travel relates to the primary direction in which the main vehicle, or in the case of debris the direction of the lane(s) in which it comes to rest, is heading. This must be related to the standard accepted local directions for the network. Under this referencing the M18 runs north-

south, although some sections are known to run almost east-west, the general accepted direction given is northbound or southbound.

The incident must be classed as being within roadworks if it is between the first cone of the lead taper and the Roadworks End sign.

The last part of Section 1 requires at least one box to be completed. The system for referencing the Highways Agency's network is not yet fully consistent from one type of road to the next, or from one area to the next. Therefore the most accurate detail should be recorded. It is not necessary to attempt to complete every box in this section.

Section 2

The second section of the sheet is related to when an incident has occurred and when it is addressed.

The date must be entered as the date/month/year, e.g. 02/12/2005. The remainder of the section refers to the times involved in the handling of the incident. These must be filled in using the 24 hour clock, e.g. 0713, 1452.

There will be occasions when the data in this section cannot be fully completed. Examples of this are when an ISU proactively finds an incident, resulting in there being no dispatch information, or where the ISU is the second ISU at an incident or is in attendance after some of the other responders.

In the cases where an ISU cannot supply all the details of the times, those details that are known must be completed as fully and accurately as possible. Therefore in the example of being the second ISU at an incident, the time of the incident can be obtained via the dispatcher, the dispatch time is known, arrival time is known and the time of clearing the incident may be known from the first ISU if they are not on site when it is cleared. The time of the other responders must be noted as best as possible.

The comments section allows the ISU attendees to record anything of merit. If times were obtained from other parties, this can be recorded here. If an attendee arrives then just leaves for an unknown reason, this can also be recorded. Any valid comment can be entered.

Section 3

The third section of the sheet is associated with the immediate weather and road conditions at the time of the incident.

Under visibility, the distance that vision is practical must be recorded. This is not precise and is to be the best estimate of the ISU team. However, good guides to restricted visibility in fog or heavy rain/spray conditions may be the number of marker posts or lamp columns that can be seen. The next section of visibility relates to whether it is daylight, or night time with or without street lighting, and must be filled in as well as the visibility.

Precipitation, road condition and wind must record the condition at the time of the incident. If the time that has elapsed between the incident and the ISU arrival is significant, and conditions might have changed within that time, the conditions at the time of attendance must be recorded.

Section 4

Section 4 is highly useful for determination of the effect of incidents in various lanes.

This section must be completed as fully and accurately as possible. However, it is recognised that some of the information requested is subjective and may not always be available. Every effort must be made to complete this section though.

Where an ISU is the second ISU to an incident and has potentially been requested to undertake a specialist role, e.g. repairing barrier damage, the first two questions in this section must be completed with the information from the first ISU.

When an incident occurs there is the possibility of traffic slowing or queuing on the same carriageway. If this happens a record must be made of the approximate length of the slow moving or queuing traffic. The queue can be seen in some circumstances, but in others, where the queue is long or trails around a corner or over a hill, then information from other attendees should be used if it is known, or an estimate based on knowledge of the circumstances should be made.

If slow moving traffic or a queue builds up behind the incident, local knowledge and experience would allow an approximation to be made of how long it might take to clear the effect of the incident. This is highly subjective but must be entered as thoughtfully as possible.

The effect of the incident on the opposite carriageway must be the maximum observed queue whilst the ISU deals with, or leaves the incident. Therefore if there are two ISUs, one of which has just been called to repair safety barrier damage, then the first ISU to leave may record one queue length, the second ISU a different length as its works go on longer and potentially have a different effect on traffic.

The first two questions must be completed for every incident.

Section 5

This section is targeted at identifying the nature of the incident and the nature of any vehicles if involved. It is split essentially in to two sub-sections; vehicle numbers and type of incident.

Where the number of each type of vehicle involved in an incident is known, this must be entered on to the sheet. However, the ISU crew is not required to approach the exact scene of an incident to collect this data where it may be inappropriate to do so. Examples of incidents where it may not be appropriate or practical to obtain details about vehicles are when HAZCHEM is involved or the police are leading an incident and have set up an exclusion zone in either instance. On occasions where the data cannot be obtained first hand, it is feasible that the other attendees may be able to provide the details. This may involve discussion with the police or other emergency services. When the details have been provided by others, the details must be entered on to the sheet and the sentence concerning data being provided by other authorities must be ticked. If HAZCHEM is involved, regardless of how this fact has been determined, it must be noted in the appropriate location.

The "Nature of Incident" sub-section must be completed by filling the box that most adequately reflects the nature of the incident.

If an ISU has been called to attend a location to remove debris, or removes debris without a call to request this, then the Debris box must be completed. If the ISU attends an incident where one or more vehicles have been involved, and this is purely related to the action of the vehicles and not that they have been caught up in a different issue, then the vehicle incident (VI) box must be completed.

If the carriageway has flooded, or has sufficient standing water to potentially cause difficulties for vehicles, then the Flood box must be completed. If there are vehicles standing in the water, or

have collided as a result of the water, then this must still be recorded as a Flood, but the “Type of VI”, Section 6, must also be completed.

Section 6

This section is only to be completed if the incident is debris related.

A lot of debris is removed from the highway during the course of a day. The debris can range from a lorry straps to settees. It is important to understand what is being removed from our network to identify if there are any issue with littering in areas or potential health and safety concerns.

The type of debris removed should seek to identify all the debris. More than one tick box can be ticked if appropriate. If the debris is very varied then appropriate boxes must be ticked and the remainder covered in the Comments section.

Under the comments section the ISU crew must seek to describe the debris in nature and size. Therefore if a lorry tyre part is removed, the tick box for this is checked and an example of the entry in the Comments box would be ‘4 foot by 2 foot, approx 7kg’. If a dead animal was removed the Comments box might be filled as ‘full grown deer’.

Section 7

This section must be completed if the incident involves vehicles by either being the incident or having been caught up in one, e.g. flooding, and relates to the type of vehicle incident attended if vehicles are involved.

This section must be completed as fully as is practical. However, we do not wish anyone to be subjected to questioning to gain the information.

Therefore the details entered here are likely to be those readily and easily discernable to the ISU crew, or to have been obtained from the normal course of asking if people are okay after an incident. Details must not be obtained by directly asking those in an incident.

Under “Type of VI”, only one box must be ticked, with comments provided where required.

Under “Cause”, only one box must be ticked. This part of Section 7 is subjective. However, there are some incidents where it is apparent that something has been a major contributory factor to an incident e.g. the height of a vehicle should it have hit the underside of a structure.

Under “Was the network damaged”, the response is yes or no. If damage was caused all the identified damaged elements must be ticked. This may mean more than one box is ticked if damage was caused.

5. ISU Data Attributes

ISU Data Attributes

	Attribute Name	Attribute Description
1.1	SVCPROVREF	Service Provider Reference number
1.2	ISU_TYPE	ISU Type attending

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	1	Motorcycle	
	2	Car	
	3	Van	
	4	Truck	
1.3	RD_CLASS		Road Class
	1	Motorway	
	2	All Purpose Trunk road	
		Attribute Name	Attribute Description
1.4	1ST_RDNO		1 st Road Number
1.5	RD_TYPE		Road Type
	1	Single Carriageway 2 lane	
	2	Dual Carriageway 2 lane	
	3	Dual Carriageway 3 lane	
	4	Dual Carriageway 4 lane	
	5	Other	
1.6	JNCT_TYP		Junction Type
	1	Main Line	
	2	Entry Slip Road	
	3	Exit Slip Road	
	4	Junction	
1.7	JNCT_NO		Junction Number
1.8	2ND_RDNO		2nd Road Number
1.9	DIR_TRAVEL		Direction of Travel of Incident
	1	North	
	2	South	
	3	East	
	4	West	
	5	Clockwise	
	6	Anti-Clockwise	
	7	Roundabout	
1.10	RD_WORKS		Roadworks
1.11	INC_LOC_OSGR		Incident Location OSGRs
1.12	INC_LOC_MRKR		Incident Location Marker Post
1.13	INC_LOC_EMERG		Incident Location Emergency Roadside Tel.
1.14	INC_LOC_LAMP		Incident Location Lamp Post Reference
1.15	INC_LOC_OTHER		Incident Location Other
	<u>TIME OF DAY</u>		
1.16	INC_TIME_HR		Hour of Incident

1.17	INC_TIME_MIN Attribute Name	Minutes of Incident Attribute Description
<u>ACCIDENT DATE</u>		
1.18	ACC_DATE	Accident Date
1.19	INC_TIME_REP	Time Incident Reported to Despatcher
1.20	CALL_TIME_DISP	Time of Call to Dispatch ISU
1.21	TIME_DISP	Time ISU Dispatched
1.22	ARRIV_INC	Arrival Time of ISU at Incident
1.23	TIME_INC_CLEAR	Time Incident Cleared from Running Lanes
1.24	TIME_LEFT	Time ISU Left Site
1.25	TO_ARRIV	Traffic Officer Arrival Time
1.26	TO_DEPART	Traffic Officer Departure Time
1.27	POL_ARRIV	Police Arrival Time
1.28	POL_DEPART	Police Departure Time
1.29	OTH_ISU_ARRIV	Other ISU Arrival Time
1.30	OTH_ISU_DEPART	Other ISU Departure Time
1.31	MOT_SRV_ARRIV	Motoring Service Arrival Time
1.32	MOT_SRV_DEPART	Motoring Service Departure Time
1.33	ARR_DEP_COMMENTS	Arrival and Departure Comments
1.34	VISIB_COND	Visibility
	1 Clear	
	2 500m to 1000m	
	3 100m to 500m	
	4 Less than 100m	
1.35	LIGHT_COND	Lighting
	1 Light	
	2 Dark, lit with streetlights	
	3 Dark, with no, or unlit, lights	
	4 Affected by low sun	
	Attribute Name	Attribute Description
1.36	PRECIP_COND	Precipitation
	1 None	
	2 Rain	
	3 Snow	
	4 Hailstone	

- 5 Sleet
- 1.37 **ROAD_COND** Road Conditions
- 1 Dry
- 2 Wet
- 3 Slush
- 4 Snow covered
- 5 Icy
- 1.38 **WIND_COND** Wind Conditions
- 1 None
- 2 Light
- 3 Moderate
- 4 Severe
- 5 Gusty

INCIDENTS IN LANE

- 1.39 **INC_LANE_HS** Incident in Hard-Shoulder
- 1.40 **INC_LANE_1** Incident in Lane 1
- 1.41 **INC_LANE_2** Incident in Lane 2
- 1.42 **INC_LANE_3** Incident in Lane 3
- 1.43 **INC_LANE_4** Incident in Lane 4
- 1.44 **INC_LANE_5** Incident in Lane 5
- 1.45 **INC_LANE_6** Incident in Lane 6
- 1.46 **INC_LANE_7** Incident in Lane 7

LANE(S) AFFECTED

- 1.47 **LANE_EFFECT_HS** Lane affected – Hard-Shoulder
- 1.48 **LANE_AFFECT_1** Lane affected 1
- 1.49 **LANE_AFFECT_2** Lane affected 2
Attribute Name **Attribute Description**
- 1.50 **LANE_AFFECT_3** Lane affected 3
- 1.51 **LANE_AFFECT_4** Lane affected 4
- 1.52 **LANE_AFFECT_5** Lane affected 5
- 1.53 **LANE_AFFECT_6** Lane affected 6
- 1.54 **LANE_AFFECT_7** Lane affected 7
- 1.55 **TRAF_EFFECT** Effect on Traffic Flow in Direction of Incident
- 1 Less than 0.5 mile
- 2 0.5 mile to 1 mile

	3	1 mile to 3 miles	
	4	Greater than 3 miles	
1.56	EST_TIME_CLEAR		Estimated time to Clear Slow/static vehicles in Direction of Incident
	1	No time to Clear	
	2	Up to 15 mins	
	3	15 to 60 mins	
	4	Over 1 hour	
1.57	LENGTH_QUEUE_OPP		Length of Queue on Opposite Carriageway/Lane
	1	None	
	2	Less than 1 mile	
	3	1 mile to 3 miles	
	4	Over 3 miles	
	5	Unsure	
1.58	NO_OF_CARS		Number of Cars involved
1.59	NO_OF_VANS		Number of Vans involved
1.60	NO_OF_LGV		Number of LGV involved
1.61	NO_OF_HGV		Number of HGV involved
1.62	NO_OF_PSV		Number of PSV involved
1.63	NO_OF_CRANES		Number of Cranes involved
1.64	NO_OF_ABNORMAL		Number of Abnormal loads involved
1.65	NO_OF_MCYCLES		Number of Motorcycles involved
	Attribute Name		Attribute Description
1.66	NO_OF_CYCLES		Number of Cycles involved
1.67	NO_OF_PED		Number of Pedestrians involved
1.68	OTHER_VEH		Other vehicle categories involved
1.69	INC_NATURE		Nature of Incident
	1	Debris	
	2	Vehicle Incident	
	3	Flood	
	4	Subsidence	
	5	Abandoned vehicle	
1.70	INC_NATURE_OTH		Other nature of Incident
1.71	DETS_PROV_OTH_AUTH		Details provided by another authority (eg Police)
	1	Yes	
	2	No	

-
- 1.72 **HAZCHEM** Hazchem involved
- 1 Yes
2 No
- 1.73 **DEBRIS_DET** Debris details
- 1 HGV/LGV Strap
2 HGV/LGV Tyre
3 HGV/LGV Lorry Part
4 Car Tyre
5 Car Part
6 Wood
7 Dead Animal
8 Mud
9 Burnt Out Vehicle
10 Fuel Spill
- 1.74 **DEBRIS_DET_OTH** Details of Other Debris
- 1.75 **VEH_INC_DET** Vehicle Incident Details
- 1 Collision
2 Fire
3 Breakdown
- 1.76 **VEH_INC_DET_OTH** Details of Other Vehicle Incident
- Attribute Name** **Attribute Description**
- 1.77 **INC_CAUSE** Incident Cause
- 1 Mechanical Failure
2 Road Conditions
3 Abnormal Load
4 Apparent Over height/
weight/length Vehicle
- 1.78 **INC_CAUSE_OTH** Details of Other Incident Cause
- 1.79 **NETWORK_DAM** Was the Network Damaged?
- 1 Yes
2 No
- 1.80 **NETWORK_DAM_DET** Network Damage Details
- 1 Safety Barrier
2 Surfacing
3 Structure
4 Lighting Column
5 Cabinet
6 Signals
7 Signage
8 Emergency Roadside Telephone
9 Fence
- 1.81 **NETWORK_DAM_DET_OTH** Details of Other Network Damage

ISU File Record Layout

Variable	Variable Description	Character Position	Data Type Integer/Alpha
1.1	SVCPROVREF	1-10	A
1.2	ISU_TYPE	11	I
1.3	RD_CLASS	12	I
1.4	1ST_RDNO	13-16	I
1.5	RD_TYPE	17	I
1.6	JNCT_TYP	18	I
1.7	JNCT_NO	19-20	I
1.8	2ND_RDNO	21-24	I
1.9	DIR_TRAVEL	25	I
1.1	RD_WORKS	26	I
1.11	INC_LOC_OSGR	27-32	A
1.12	INC_LOC_MRKR	33-47	A
1.13	INC_LOC_EMERG	48-62	A
1.14	INC_LOC_LAMP	63-77	A
1.15	INC_LOC_OTHER	78-107	A
1.16	INC_TIME_HR	108-109	I
1.17	INC_TIME_MIN	110-111	I
1.18	ACC_DATE	112-119	A
1.19	INC_TIME_REP	120-123	A
1.2	CALL_TIME_DISP	124-127	A
1.21	TIME_DISP	128-131	A
1.22	ARRIV_INC	132-135	A
1.23	TIME_INC_CLEAR	136-139	A
1.24	TIME_LEFT	140-143	A
1.25	TO_ARRIV	144-147	A
1.26	TO_DEPART	148-151	A
1.27	POL_ARRIV	152-155	A
1.28	POL_DEPART	156-159	A
1.29	OTH_ISU_ARRIV	160-163	A
1.3	OTH_ISU_DEPART	164-167	A
1.31	MOT_SRV_ARRIV	168-171	A
1.32	MOT_SRV_DEPART	172-175	A
1.33	ARR_DEP_COMMENTS	176-225	A
1.34	VISIB_COND	226	I
1.35	LIGHT_COND	227	I
1.36	PRECIP_COND	228	I
1.37	ROAD_COND	229	I
1.38	WIND_COND	230	I
1.39	INC_LANE_HS	231	I
1.40	INC_LANE_1	232	I
1.41	INC_LANE_2	233	I
1.42	INC_LANE_3	234	I
1.43	INC_LANE_4	235	I
1.44	INC_LANE_5	236	I

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Why do we need a Standard Incident Management Plan?

The Highways Agency, as an Executive Agency of the Department for Transport, is responsible for managing, maintaining and operating the strategic road network of England, which includes all motorways and a significant proportion of trunk roads. In the case of a 'National Incident' under the Civil Contingencies Act 2004 as a Category 2 Responder it becomes involved with any 'incident' that adversely affects or disrupts the normal operation and availability of the strategic road network. These include incidents involving vehicles and such things as terrorist threats/activity, demonstrations on the roads or severe weather.

The business objectives of the Highways Agency that relate to Incident Management are:

- Improving road safety.
- Reducing congestion and improving reliability on the strategic road network through:
 - A programme of improvements to the strategic road network,
 - Improved management of incidents and roadworks,
 - Influencing travel behaviour through better information to inform journey choices.

The Public Service Agreement (PSA) targets for the Highways Agency that relate to Incident Management are:

- By 2007-08, make journeys more reliable on the strategic road network.
- Reduce the number of people killed or seriously injured in Great Britain in road accidents by 40% and the number of children killed or seriously injured by 50%, by 2010 compared with the average for 1994-98, tackling the significantly higher incidence in disadvantaged communities.

As such, the Agency has certain functions, objectives and responsibilities to fulfil. To do this will, on numerous occasions, mean working with other agencies. Consequently, there is a clear need for the Agency to have in place an effective and efficient standardised Command and Control system. This system must enable co-ordinated and cohesive working and be compatible with the Emergency Services and other responder organisations.

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Highways Agency Traffic Officer Service

The Traffic Officer Service and Incident Support Units are the visible presence of the Agency on the strategic road network and in particular the motorways. The Traffic Officer Service is key to enabling successful working partnerships with the police service, the fire service, the ambulance service and other agencies who provide a response to incidents and events on the road network. It provides the Agency's first response to incidents or events through requests for service, to Regional Control Centres, Traffic Officer Service patrols and through the Highways Agency's service providers.

Components of the Standard Incident Management Plan

The Agency's Standard Incident Management Plan consists of three parts:

Standard Incident Management Plan	Framework Document	Strategic overview of the Agency's Incident Command and Control Co-ordination Structures and Systems	Strategic
	Guidance Document	Defines clear functions and responsibilities of all those involved in managing or supporting those managing an incident	Tactical
	'The Way We Work' manuals	Detailed "Process Instructions" on how to carry out specific tasks	Operational

This framework is applicable to and compatible with the Agency's Area/Regional Contingency Plans and the National Crisis Management Plan.

The Traffic Officer Service is only one of a number of service functions that the Agency has at its disposal. The plan includes descriptions, responsibilities and accountabilities for all functions throughout the Agency that can contribute to the resolution of an incident. However, the initial focus is on the Traffic Officer Service.

Standard Incident Management Plan

Framework Document Strategic overview of the Agency's Incident Command and Control Co-ordination Structures and Systems Strategic

Guidance Document Defines clear functions and responsibilities of all those involved in managing or supporting those managing an incident Tactical

'The Way We Work' manuals Detailed "Process Instructions" on how to carry out specific task Operational

Gold/Silver/Bronze Incident Command Structure

The Agency will employ the standard Gold, Silver and Bronze Command of incidents in line with the Police and other emergency services. Incidents are escalated by the existing Commander to the next level when they require additional resources or coordination.

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Incidents should be commanded at the lowest level where the Commander has the authority, competencies and resources to resolve the incident.

Recent reviews and analysis of operational incidents involving the Agency have highlighted the need for the Agency to work in a disciplined, co-ordinated and controlled manner under the Command and Control of a clearly defined Agency Incident Commander to bring about an effective resolution to the incident and achieve the Agency's objectives and PSA targets. Thus there is a need for a Standard Incident Management Framework (SIMF).

Bronze	Operational Commander at incident
Silver	Tactical Commander
Gold	Strategic Commander
Gold Coordinator	Coordinates strategy across the Highways Agency

Context of the Standard Incident Management Framework

The Highways Agency Standard Incident Management Plan is a compilation of practices and procedures based on legislation, agreement, experience and good practice. The Agency recognises that the emergency services will take the lead at many incidents, and seeks to offer them support.

To achieve compatibility and thereby alleviate the potential for confusion between and within the various response agencies, the procedures, terminology and documentation contained within this document have been standardised wherever possible. The framework will share common terminology with other responder organisations, which will be adopted throughout the Agency and by its service providers to avoid misunderstandings.

There is an obvious expectation that all Agency activities will be conducted reasonably and within the bounds of the law.

The legal parameters within which the Agency operates are encompassed within:

1. UK Domestic Law including
 - The Highways Act 1980
 - Traffic Management Act 2004
 - Civil Contingencies Act 2004
 - Data Protection Act 1998
 - Human Rights Act 1998
 - Control of Substances Hazardous to Health Regulations 1994
 - Health & Safety at Work Act 1974 and related regulations
2. International law, specifically the provisions of the European Convention of Human Rights (ECHR).

During the development of this framework, consideration has been given to the compatibility of the processes and related procedures with the Human Rights Act. Particular attention has been given to the legal basis of its precepts, the legitimacy of its aims; the justification and proportionality of the actions intended by it, that it is the least intrusive and damaging option necessary to achieve the aims, and that it defines the need to document the relevant decision making processes and outcomes of action.

This framework is a living document and will be maintained by the Agency. The need to ensure an inclusive approach to the delivery of the service is of paramount importance. To this end it will be published on the Agency's intranet and formally reviewed on a regular basis. However, it is

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intended that amendments will be posted as necessary on the Agency intranet (Way we Work site).

Enquiries regarding the content of this document should be emailed to:
SIMF@highways.gsi.gov.uk

Command, Control, Co-ordination

Central to any plan is the system of operational decision-making and control. There are two main activities concerned with command and control of an incident and these must be seamlessly combined if command is to be effectively exercised. They are:

- The command system for the execution of decisions and the carrying out of operational plans.
- The support system (support and supply functions) - the collation and dissemination of information, the co-ordination of human resources, the identification of equipment and the creation of plans and options. These support requirements, in different proportions, are common regardless of incident type and provide the context in which to make decisions.
- Two principles that are at the centre of an effective approach are that:
- Common terms and command structures are used
- These terms and command structures should fit normal working practices and reinforce recognised methods.

In this context:

Command means the authority for an organisation to direct the actions of its own resources (both personnel and equipment).

Control means the authority to direct strategic and tactical operations in order to complete an assigned function. It includes the ability to direct the activities of other agencies engaged in the completion of that function. The control of an assigned function also carries with it a responsibility for the health and safety of those involved.

Co-ordination means the harmonious integration of the expertise of all the agencies both internally and externally with the objective of effectively and efficiently bringing an incident to a successful resolution.

In the case of the Agency the Regional Control Centres are at the centre of this framework. They work with other responder organisation control centres engaged in resolving the incident. They must be capable of using and activating a command system with a support system that complements the normal method of incident response when required.

Where the scale, volume, intensity or duration of some scenarios is beyond the capacity of a single Agency operating base or region, a set of common procedures is set out in the Agency's National Crisis Plan. This will ensure that command is cohesive and resources are harnessed, co-ordinated and organised with purpose. The response to such scenarios must be such that it can withstand significant scrutiny at a later date.

SIMF is equally applicable to police-led, other service-led or Agency-led incidents as indicated in the National Guidance Framework for the Traffic Officer Service and the Guidance on Policing Motorways.

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Principles of Incident Command

The principles contained within this document are fundamental to the command and resolution of any incident no matter how serious and no matter the grade or level of the person in command.

Effective command requires the provision of administration and support functions to extend the thinking of the Commander. It also requires a regime, a disciplined organisation of people and systems in which the function holders are empowered to execute strategy and deploy resources.

The exercise of command is always situational. Command is not, however, merely a mechanical response. The SIMF places the Incident Commander in a position to exercise control, but command at any level also involves leadership and perspective. An Incident Commander must balance competing demands in a complex environment and, because of these complexities and their accountability, they will find it advantageous to operate according to a set of command principles.

Incident Command has four critical elements. These are:

- Decisions being made by those empowered to do so and from those decisions, instructions being distributed.
- A climate supporting effective decision making being created.
- A level of competence being in place, i.e. that the Incident Commander will be versed in the general rules embodied in professional good practices.
- An established command and incident management structure within each Agency region.

An Incident Commander can depart from the general rules provided that they do so from a position of full knowledge of the prevailing circumstances, and can justify their decision to do so through a Dynamic Risk Assessment. The Incident Commander should document any departure from the general rules.

Command is also about delegation. The more tactical the decision, the more local the decision-making will need to be. Plans at the highest level should always be of a general nature and focus on the mobilisation of information and resources to enable local Commanders to achieve a given aim. Tactical deployment to achieve that aim is usually devolved to those with the most immediate knowledge and sufficient resources to deal with the situation. For example, winter weather initiatives have a national strategy, tactically developed in more detail in the regions and areas and operationally detailed at the local depots.

In this context, command is a descending structure. At the highest levels the plan is general. At each level of authority beneath this, the decisions become progressively more specific.

The decision maker should be in a position to have an overview and perspective of the entire scene of operations within their command, and control of sufficient resources to achieve their aim.

Command at any level assumes responsibility for everything that occurs beneath. Vicarious liability of this sort is a serious responsibility. Commanders may rightly seek assurance that what is happening within their sphere of responsibility but out of their view is being dealt with appropriately. To this end, Commanders should, as necessary, become mobile and make personal assessments both of the situation and the ability of subsidiary Commanders. **They do this to make a first-hand assessment, NOT to take over responsibility.**

If subsidiary command is not coping it may be because they are inadequately supported and the Senior Commander may provide more resources. If they are not coping because they are not capable or have become exhausted then they should be replaced. The Senior Commander

should intervene in this way, but not by taking the decisions associated with the position they are observing.

In the event that the Gold Commander departs the location of Gold Command, generally the Gold Support Lead (see page 27) will assume their seat. The Support Lead will of course be in direct contact with the Gold Commander and should sustain communication links at all times. This principal also applies to the Silver Commander.

If too rigid a view is taken about the distinctions between Gold, Silver and Bronze roles, command develops a bunker mentality - Senior Commanders become merely logistics officers and remote from critical decisions. The art of command is to achieve the appropriate balance between maintaining the strategic control associated with the position, but being on hand enough to assess and influence the performance of subsidiary Commanders. No matter how successful an intelligence system is, there is often no substitute for the Commander taking a close-up view of critical zones of activity and to intervene directly in bottlenecks where necessary.

Overall the Commander has to be decisive but sufficiently light of touch to encourage situational leadership. The development of strategy implies the choice of a plan. The implementation of a plan requires the issue of instructions. Instructions should be succinct, unambiguous and clear about the flexibility allowed. As familiarity can vary as much as circumstances, the level of intervention Senior Commanders should make will depend on the situation. A Commander familiar with his or her Silver and Bronze Commanders will need to spend less time seeking assurance. Where that familiarity and knowledge does not exist, the Commander and subsidiary Commanders will gain reassurance from more frequent contact until a proper rapport is established.

Commanders should be precise about the aims, delegate the means to carry them out, and satisfy themselves that things are working by whatever suitable means.

Objectives of Incident Command

The specific objectives of the Agency and it's service providers in the management of incidents are:

- restoring the network to normal conditions as quickly as possible,
- minimising the effect of an incident on the travelling public
- providing information to road users, management and Ministers.

Common objectives

In addition to the specific objectives of the Agency, all the organisations involved in the management of an incident will work to the following common objectives set out in the Civil Contingencies

Act 2004:

- saving and protecting life
- relieving suffering
- protecting property
- providing the public with timely information
- containing the emergency – limiting its spread
- maintaining critical services
- maintaining normal services at an appropriate level
- protecting the health and safety of personnel
- safeguarding the environment
- facilitating investigations and inquiries
- promoting self help and recovery

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- restoring normality as soon as possible
- evaluating the response and identifying lessons to be learned

Incident Resolution and Risk

The handling of any incident requires a strategy for resolution. The more serious the incident, the greater the assumption that things could go wrong. The situation carries risks and the Incident Commander's objective is to bring a difficult situation under control. **The primary thought should be one of efficient resolution.**

The issue of risk is central to decision making. There is a danger that estimating risk produces risk-averse Incident Commanders. This condition is made worse by the expectation of subsequent reviews and tribunals operating in opinionated conditions and with the wisdom of hindsight.

The concept of assessing risks should, lead to risk management, not to risk aversion. Risk assessment, particularly at command level, is comprehensive. That is to say the full range of hazards should always be considered and the necessary control measures evaluated in terms of reasonableness and practicality. It is recognised that everyone involved in the incident is potentially exposed to the risk arising from these hazards.

Efficient resolution is based on obtaining a balance between a number of considerations:

- Safety of members of the public;
- Safety of Responders;
- Earliest reasonable resolution;
- Impact of prolonged situation on the public, including congestion and
- Most efficient resource use.

Efficient resolution can only be achieved by balancing risks

Recording of Commander's Decisions (Decision Logs)

The handling of any incident will require the Commander to decide the strategy and the overall objectives for resolving that incident. The most appropriate tactics and operational methods for achieving the strategy and objectives will then need to be considered and decided upon from a range of possible tactics. This involves making balanced judgements which are reasonable in the circumstances.

Incident Commanders must record their decisions and the reasons on which they are based. The dimensions are time (and thereby disruption), resource (the greater the resource deployment the less available those resources are for other incidents) and opportunity (options for intervention). Decisions must be based on an assessment of whether the options for intervention are convincing. They should also take account of Human Rights in the areas of proportionality, legality, necessity and intrusiveness.

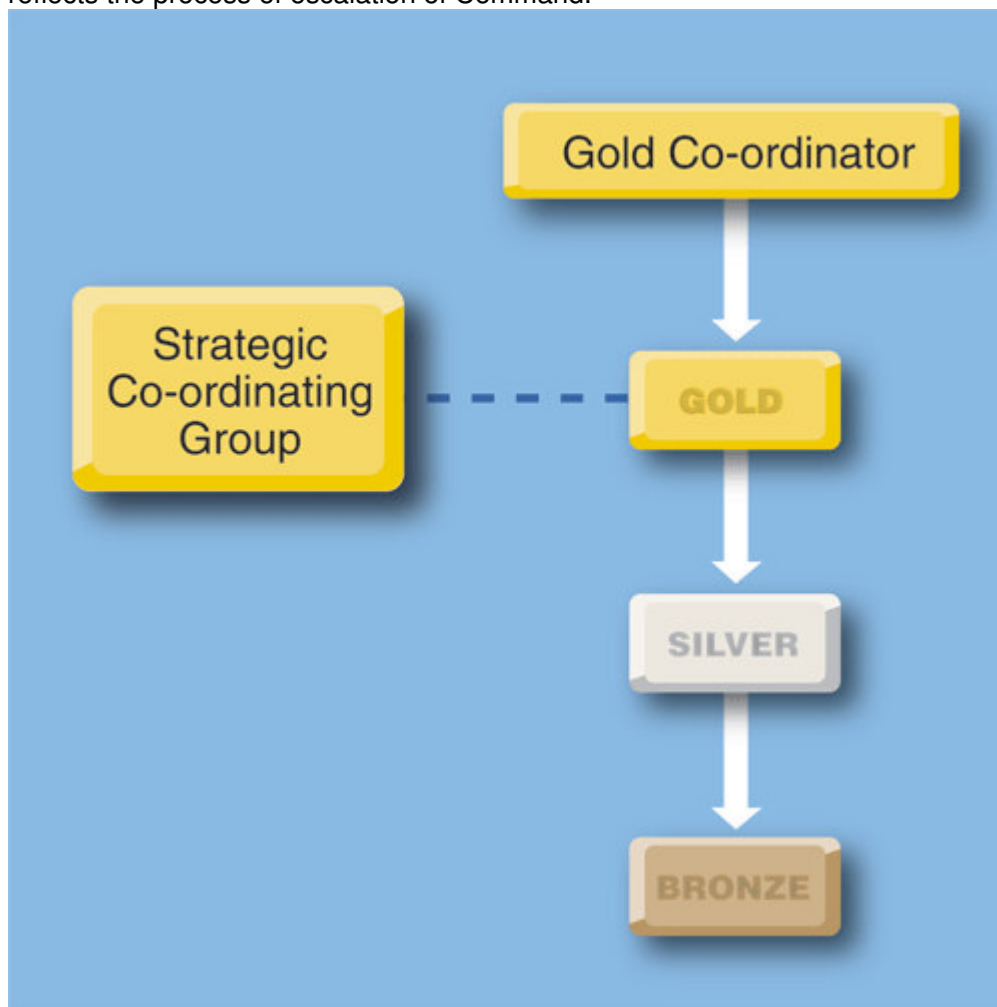
These options should consider the impact of dislocation and disruption and calculate the cost and availability of resources, setting these things against the likelihood of real physical risk to victims or responders. This will be a record of their strategy for resolution.

The Command System

The purpose of this section is to outline the first element of the regime. This is the Command System. This is based on the Gold/Silver/Bronze levels of command which correspond directly to the three levels of incident management recommended to all response organisations, i.e. GOLD

= Strategic, SILVER = Tactical & BRONZE = Operational. It also acknowledges the “Gold Co-ordinator” level. These levels are not in their own right rank-specific but invariably they will reflect the level of responsibility, experience, capability and empowerment that the role holder has within their organisation in dealing with the incident.

At the start of any incident for which there has been no warning the operational level will usually be activated first, with the other levels, tactical and strategic, being established with the escalation of the incident, or a greater awareness of the situation. It is possible that in some incidents, particularly those where there is a threat of a potentially serious problem, the activation of the three levels will be concurrent. Consequently this section is presented in a manner that reflects the process of escalation of Command.



Incident commanders line of command

Bronze

Bronze can be summarised as a level of operational deployment, reporting to Silver (when established) with a responsibility to carry out a particular plan or set of duties. There may be more than one Bronze depending on the scale of the incident (e.g. multiple scenes).

This level reflects the normal day-to-day arrangements for responding to smaller scale incidents. It is the level at which the management of ‘hands-on’ work is undertaken at the individual site.

Where the scale of the incident is such that resources needed are outside of the Bronze Commander's sphere of responsibility, an early requirement will be to consider whether circumstances warrant escalating by setting up a tactical (Silver) level of management.

The first Agency visible representation at the scene of an event will usually take on the function of Bronze and will take appropriate immediate measures and assess the extent of the problem in line with agreed procedures. They will retain this role until relieved either by a Supervisor or a more experienced officer on the instructions of the RCC.

They will concentrate on specific tasks within the Agency's areas of responsibility and remit, for example, the closure of junctions to prevent more traffic joining the rear of an incident and for advanced traffic management to prevent congestion. Should it be necessary, consideration should be given to assigning control for a specific task or area to a designated officer or service provider subsequently called to the scene. The command of the resources belonging to the Agency and applied within a geographical area, or used for a specific purpose, will be retained by the Agency. Each agency must liaise fully and continually with other responder services employed within the same area to ensure a sufficient and combined effort. If appropriate, the police will normally act as the co-ordinator of this response at the scene (Part 1 Section 4.1 and 5.5 of Traffic Management Act 2004 as it applies to Agency staff should be borne in mind as should The National Guidance Framework between the Agency and Association of Chief Police Officers (ACPO)).

These arrangements will usually be adequate for the effective resolution of most incidents. However for more serious or complex incidents requiring significantly greater resources, it may be necessary to implement an additional level of management such as Silver Command.

Silver

Silver can be summarised as a level of Tactical Command which carries out the plan for resolution and delivers Gold's strategy, when established. (There may be more than one Silver, depending on the scale of the incident e.g. multiple scenes)

It will involve a tactical level of command that exists to determine priority in allocating resources, to plan and co-ordinate when a task will be undertaken, and to obtain other resources as required. They must take appropriate risk reduction measures and give due regard to health and safety requirements.

Should the Agency establish Silver Control (from where Silver will direct the tactical operations) this should normally be at the Agency RCC Silver Command Suite. The Silver Commander needs to consider where the best place is for them to undertake their role and in exceptional circumstances an alternative location may be determined. This should be done in consultation with other services, who may have a better appreciation of the safety issues in those particular circumstances. If this is done it is always advisable to identify a secondary site to which these controls can re-deploy should changing circumstances make this necessary.

Where there is one identifiable scene, tactical management may be undertaken from an Incident Control Point established in the vicinity. Many tactical functions will then be discharged at or close to the scene. Where the Agency is operating Silver Control from its Regional Control Centre, Silver must ensure a Liaison Officer is present to enhance co-ordination.

When more than one agency is working at the Tactical Level there must be consultation between the various agency Incident Officers. In order to affect co-ordination, an inter-agency meeting should be held at regular intervals attended by each Tactical Commander or their empowered representative. Establishment of inter service communication links will support the running of the incident at the scene. Normally a written record of meetings should be maintained.

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Planning must also take into account that there may be a number of individual scenes each requiring a Tactical Commander.

The Tactical (Silver) Commanders should not become involved with the activities at the scene being discharged by Operational (Bronze) Commanders.

Tactical managers must concentrate on overall management. While they need to be aware of what is happening at Operational level they should leave the responsibility for dealing with that level to Operational Managers.

If it becomes apparent that resources or expertise beyond the level of the Tactical Commander is required, or if there is a need to co-ordinate more than one incident/scene (where Tactical Command has been established) it may be necessary to implement a Strategic Level of management as soon as possible (Gold).

Gold

Gold can be summarised as coordinating, managing impact and collateral consequence, setting the strategy, providing resources and agreeing the scale of events.

In exceptional circumstances, one or more agencies may find it necessary to implement a Strategic Level of management. Incidents can place considerable demands on the resources of the responding organisations, with consequent disruption to day-to-day activities. Such matters require attention by senior management.

In these circumstances a Gold Command should be established as a matter of routine rather than the exception. It is easy to dismantle if not required and removes the potential for Tactical Managers/Commanders to be reluctant to ask for a Strategic Level of Management/Command. The need for a Strategic Level may arise if Tactical Management does not have the required resources or expertise available. It may also arise if there is a need to co-ordinate more than one incident/scene for which Tactical Command has been established. Strategic Management is normally undertaken away from any incident scene.

The requirement for Strategic Management may be confined to one particular agency. However, certain incidents require a multi-agency response at the Strategic Level when the issues that arise affect the responsibilities or activities of more than one organisation.

The purpose of the Strategic, overall Command is:

- To take overall responsibility for incident management and establish a framework of policy for that incident within which the Tactical Commander(s) will work;
- To give support to the Tactical Commander(s) by the provision of resources;
- To give consideration to the prioritisation of demands from the Tactical Commander(s); and
- To determine plans for the return to normality once the incident is brought under control.

Strategic Co-ordinating Group

Strategic Co-ordinating Group can be summarised as an enabling group at Gold Command Level existing in an incident in which a multi agency commitment and response at Strategic Level is required to bring about an effective resolution. This group will take some time to assemble and should be involved in only the more serious incidents when a longer-term multi agency co-ordinated strategy is required.

In accordance with nationally agreed procedures it will normally be a police responsibility to establish and Chair the Strategic Co-ordinating Group. The Group will comprise a nominated member from each agency involved. Each person must be able to make executive decisions in

respect of resources within their agency and have the authority to seek the aid of other agencies in support of their role. The Agency should ensure their presence on this group wherever an incident impacts on the Strategic Road Network.

Agency representation on this Group should be a person who is empowered to make executive decisions in respect of resources within the Agency and have authority to seek the services or aid of other providers and responders on behalf of the Agency in support of the Agency's functions. The representative would not normally be the Incident Commander, as that would significantly detract them from their role at that time. Good communication channels will be required between the Agency's representative on this Group and Agency Gold or Silver.

Tactical decisions are not the responsibility of this group. The group members will need to be supported by a number of members of staff provided by the various agencies involved. As the incident develops there should be regular evaluation of the need and purpose of the group. It is normally the police responsibility at a major incident initially to co-ordinate the strategic role of the agencies involved. However it is recognised that due to the nature of certain multi agency incidents this role may be undertaken by, or at some stage be passed to, another agency.

It is a fundamental principle of this system that officers of the various agencies consult on a regular basis. They must also consult with agencies providing additional resources required at the scene, and maintain a strategic overview. These management arrangements will need to be adapted to the task in hand and should be flexible enough to reflect changing circumstances, but it is good practice to adopt a corporate approach, with all meetings documented and signed by those present.

The Strategic Co-ordinating Group should be aware of its wider role which may encompass central government interests, handling requests for advice from individual services and agencies, and media demands. The group will ensure that strategy for dealing with the media is in operation, designate a media briefing centre and appoint a media briefing centre manager. The Agency will manage traffic related matters.

Members of the Strategic Co-ordinating Group should not normally attend the scene. They should remain with the group throughout in order to foster the establishment of trusting relationships between members of the group and an understanding of each other's strategic objectives and the sometimes complex negotiations which are required to achieve a particular outcome. If absent for any reason they must appoint a substitute from within their agency with full authority to discharge the strategic function. In a long running incident the need for personnel to hand over to a colleague will arise. It is preferable for agencies to stagger this hand over in order to maintain expertise as new members become fully briefed on the incident.

The Strategic Co-ordinating Group should be based at an appropriate pre-determined location, normally away from the noise and confusion of the scene. In some areas a purpose built Command Suite exists, in others contingency plans should identify the accommodation to be used. Because of the police function to initially chair the group it may be considered suitable for a Police Control Centre to be used.

Gold Co-ordinator

Gold Co-ordinator can be summarised as setting strategy and co-ordinating resources on a national level for incidents that are cross regional or have a profound national impact.

While command and responsibility for incidents remains at a regional level, in some circumstances it is necessary to coordinate not only resources but also strategy in relation to events having a significant national impact. Where these conditions apply, the National Traffic Director or nominee will become the overall Strategic Director with the description Gold Co-ordinator.

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This role is required in the event of:

- A National Major Incident
- Or
- An incident involving more than one Agency region
- Or
- Where the Agency Crisis Management Team (CMT) is mobilised

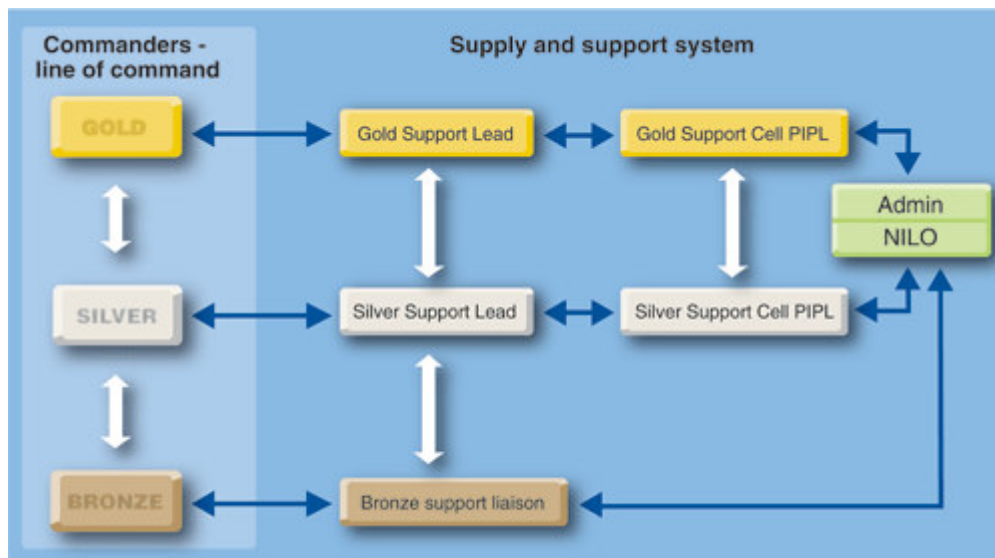
The CMT operates under the supervision of the National Traffic Director or a deputy coordinate the supply of additional resources. (As outlined in The Agency National Crisis Management Plan)

The Agency has a role to support the Dft Incident Room concept of Operations (CONOPS). The Chief Executive or Gold Co-ordinator may have a seat within the Cabinet Office Briefing Room (COBR) and will endeavour to develop a national strategy in conformity with various departments of state. Whilst all command decisions must be taken locally the framework presumes conformity to general strategic direction in the event of a national emergency.

The Supply and Support system

The purpose of the Supply and Support System is in part to service the Gold and/or Silver Commanders with the best possible information to make decisions. It is also to provide them with space and time in which to make those decisions.

Essentially decision making in this context is about issuing instructions to achieve the outcome presumed in a plan. Planning options are a function of what we know and can best forecast with accurate situational awareness (good information flows); what resources we can muster; and our specialist capabilities.



The Gold Support Lead and Silver Support Lead coordinate: Planning, Information, People and Logistics (PIPL) Support functions and the staff performing them so that in a difficult or fast moving environment they are able to provide a current statement of events and options from a single point. This reduces speculation, lack of information and improves the 'world view' of the Commander. During 'normal' operation it also insulates the Commander from being interrupted with minor logistical and operational decisions. The local Commander retains flexibility over how best to maintain situational awareness.

	Planning	Information	People	Logistics
Gold support lead	<ul style="list-style-type: none"> • Immediate action plans • Considered action plans • Contingency plans 	<ul style="list-style-type: none"> • Collation • Dissemination • Briefing • Debriefing • Link control rooms • Intelligence reports • Situation reports • Media strategy • Impact assessment 	<ul style="list-style-type: none"> • Staff resources • Technical specialists • Contractors • Resilience • Welfare and support • Health and safety 	<ul style="list-style-type: none"> • Support and identify key sites for: <ul style="list-style-type: none"> • Briefing • RVP's • Holding FCP's • Supply: <ul style="list-style-type: none"> • Communications • Transport • Plant and machinery • Signage • Cordons • Cones • Lighting etc.
Silver support lead				
Bronze support liaison				
	Admin – NILO			

The Support Leads are responsible for receiving instructions from Commanders and apportioning work through the support system. Support Staff work formally to their Commander at Gold or Silver and informally between each support level. For example, a commander may indicate a particular requirement for vehicles and within the support system the Silver support staff will make their requirements known to their support equivalent in the Gold Support Office or Gold Control Room, who will do their best to mobilise Agency resources and distribute them.

The Support lead will arrange meetings, record and disseminate decisions and action requirements. This forum will include people the Commander deems it necessary to have present. In fast moving circumstances it may be a meeting of the Commander and Support lead alone.

Where other agencies are involved, their participation in the Group should be at a senior level with the authority to make decisions and commit resources. Depending upon the nature of the event there may also need to be liaison 'officers' from other agencies available at the Police Incident Control to assist with information gathering and the development of plans. This liaison is important to develop synergy and conformity with the overall Police Command. Consequently, other agencies will need to maintain a seat as required, in either the Gold Control or Silver Control or possibly both.

The support system has a particular advantage. If personnel are trained in key roles at each level, they will transmit information requirements up and down the staff system thus enabling rapid supply and development without immersing the Commander in logistical issues. For example, where an overall plan of action is decided on, staff at each level will develop their own plans of action and decide on the appropriate levels of personnel, transport and communication required to facilitate the outcome. The commander will then be free to execute the plan.

During a large protracted incident, Gold should have a Support staff capability providing the information for this level of Command to set a strategy and deliver command decisions; Silver (or Silvers) should have a parallel Support staff capability to facilitate tactical decision making; at Bronze level there should be a staff liaison so that information can be captured and passed through the staff system. Where there are smaller or less protracted incidents these functions will still need to be performed, but the scale of resources required will be influenced by the nature of the incident.

□ ***The Gold Commander***

Has sole and overall command of the operation and is responsible for its success. Briefings and reports from Gold should be fed into PIPL via the Gold Support Lead and vice versa. The communication route from Silver Command to Gold is imperative to ensure a shared situational awareness. However the normal route for general information is via the PIPL Support system.

□ ***The Silver Commander***

Responsible for achieving the objectives that fall to their discrete command and can vary in scale from a small scale incident to directing a large number of staff. The Silver Commander and staff must ensure they share the same 'situational awareness' as the Gold Command and other Silvers to ensure the effective resolution of the crisis.

Gold Support Lead & Silver Support Lead

A Support Lead is a senior position assigned to a member of staff who would be (depending on the scale and nature of the incident) working closely to a Commander. They transmit the decisions and instructions of the Commander with authority to execute the Commander's directions in the Support System and by virtue of the post must have access to their Commander at all times. The Support lead may act on their Commander's behalf in the immediate absence of their Commander but should seek to maintain contact at all times.

The Gold Support Lead

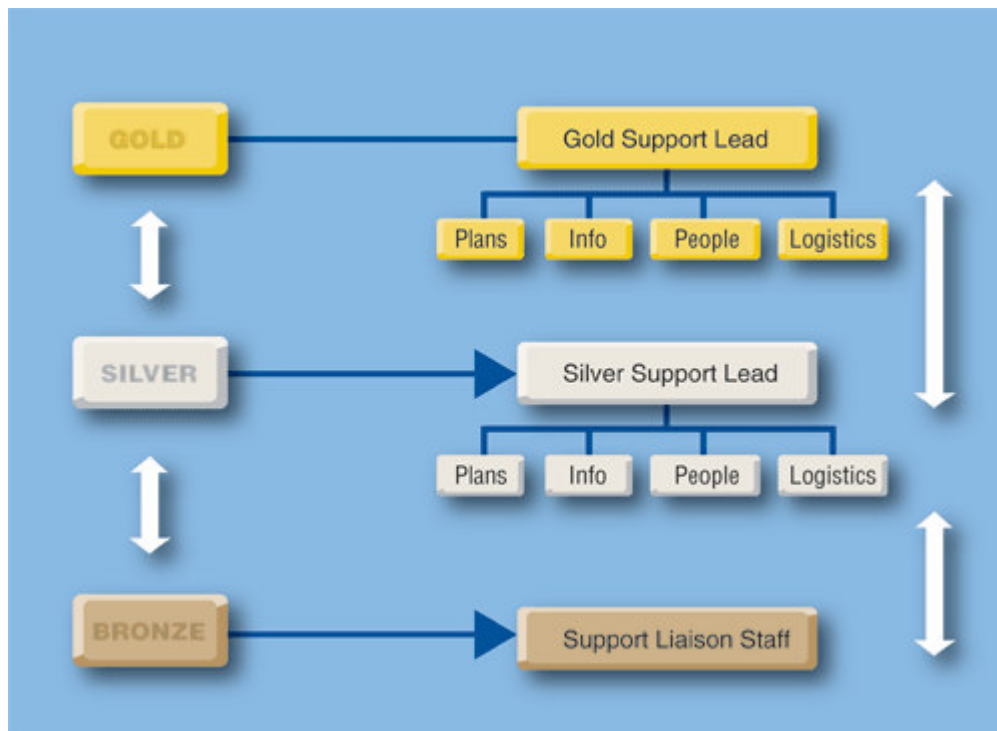
Provides an important role in overseeing the strategic imperatives and ensuring objectives are being met. They have a significant role in assisting with the formulation of policy with Gold and the Gold Coordinating Group, as well as coordinating the Strategic objectives of PIPL.

The Silver Support Lead

Has a similar role to that of the Gold Support lead in that they support policy making and tactics whilst ensuring that the objectives of the operation are met. They have a significant role in assisting with the formulation of tactical plans with Silver and the Tactical Coordinating Group, as well as coordinating the Tactical objectives of PIPL.

Supply and Support - structure and functions

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Support and Supply System

Staff are assigned according to their specialist knowledge and skills in the support and supply functions as required. These functions are carried out by Agency staff who have the requisite training, competence and experience in the function they are undertaking.

While individual circumstances may cause the Gold Commander to vary or expand support functions, in general the support functions and PIPL are standard to most incidents and should be practised as part of the overall plan.

Support staff generate planning options but do not coordinate or execute plans. They collate and analyse information and supply personnel and equipment. The use and publication of information and the deployment of resources is a matter for Commanders.

PIPL (Planning, Information, People, Logistics)

PIPL is an acronym for the combined functions of the support system and represents the management of information, material, people and options for their deployment.

The Support and Supply Functions

Planning	Information	People	Logistics
Gold support lead	Silver support lead	Bronze support liaison	

- Immediate action plans
- Considered action plans
- Contingency plans

- Staff resources
- Technical specialists
- Contractors
- Resilience
- Welfare and support
- Health and safety

Support and identify key sites for:

- Briefing
- RVP's
- Holding FCP's

Supply:

- Communications
- Transport
- Plant and machinery
- Signage
- Cordons
- Cones
- Lighting etc.

Planning

The planning function is responsible for generating immediate operational plans as options for the Commander. Plans have to be realistic and are limited by time and the availability of resources. Plans may, therefore, be 'immediate action plans' which can be carried out in a short time frame or 'considered action plans' which take more time to develop. Plans must also be developed that manage identified risks. Planning Support Staff must actively engage in the identification and assessment of risk and provide options for the management of risk as appropriate.

At Gold level, the planning function generates options for Commanders in line with the broad strategy. They may, for example, look at area evacuation plans, isolation plans, transport and route planning or plans for consequence management.

At Silver level, the planning function would convert the general plan into a set of specific actions within a particular realm of activity and place. Planning in this context is to be distinguished from the 'Network Access and Resilience Teams' function of developing Contingency Plans.

Contingency Plans developed in slow time are rarely incident specific, although they may be. Where they exist, they can be used to develop operational plans.

Information

The Information function provides Commanders with accurate and up to date information, which is evaluated and assessed with a view to informing strategic and tactical decisions. The support staff for information will be responsible for linking to the intelligence system and obtaining and distilling information about the incident that may be useful in resolving it.

The early establishment of a system for information management and supply relieves those responsible for operational command and decision making from the constant demands for information.

It ensures all who need to know are in possession of relevant information. It enables the best available account of the whole operation to be collated. The system provides for an objective assessment of the success or otherwise of strategy and tactics. In long running major incidents support staff for information will work closely with support staff for planning to identify alternative courses of action in the light of prevailing assessments.

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The information system should use the technologies and disciplines of the Agency intelligence system and usually rely on seconded intelligence staff to carry out these functions. A critical part of this role is to provide the best “live” information and interpretation for Agency Briefing Officers.

The Information function also plays a significant role in linking RCC’s to the incident by monitoring and collating the state of the incident and reporting to the Commander through “situation reports.” They should ensure that information flows to road users, and that a media strategy is implemented in conjunction with NTCC and the Press Office.

Informing others of an ‘Agency’ Critical incident

Making others aware of a critical incident and keeping them informed of developments is a distinct function quite separate to the command of the incident.

In the first instance when a critical incident is discovered or reported the person receiving the information should ensure that the National Incident Liaison Officer (NILO) is notified as soon as practicable. NILO will then inform the relevant parts of the Agency and ensure that those who need to be updated or made aware are provided with the necessary information in accordance with the procedures that are outlined in the Emergency Contact Procedures.

It is imperative for the smooth command of an incident to have rigid adherence to these information processes, as the Incident Command and Support team can then concentrate on incident resolution.

People

The People function is responsible for the supply of the right numbers of people in the right place at the right time. Their role is to develop an incident people plan in line with the requirements of operational commanders and the agreed protocols in respect of Agency technical specialists and the co-ordination of Incident Support Units (ISU’s) and contractors. Incidents running over extended periods of time can make heavy demands on personnel, particularly specialists. Resource support staff must, therefore, be practised in developing resources on a sequential basis allowing for the replacement and refreshment of both front line staff and Commanders. They are responsible for ensuring that briefing locations, debriefing locations, rendezvous points and marshalling areas are properly managed, and for assuring the Commander that welfare and safety issues are properly managed.

Logistics

The Logistics function is responsible for organising and delivering communications networks, sufficient operating centres, administration support, transport, equipment, and heavy plant when required. A well-rehearsed logistical capability enables Commanders to act to resolve a situation quickly. The normal operations of a Region in providing transport, communications and other logistical commitments need to be brought to a level of readiness consistent with being part of a public service so that the Logistics function can accelerate the use of existing mechanisms.

The Cadre System

To enable the command and support functions to be effective and efficient, trained and experienced people who have a thorough grounding in the functions that they are performing must be utilised. Experience within the Police and other services has shown that a Cadre system utilises resources far more effectively and efficiently than a general competence approach.

The term Cadre is used in this context to refer to people with a particular appropriate and professional competence and who are available, and trained to fulfil that function if called upon.

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The number of functions within the SIMF is considerable and includes positions at all levels. There may be some functions, e.g. Structures Engineers, Crash Barrier experts, who are permanently retained as specialist advisors (see page 34) but many other functions rely on personnel reverting in an emergency to a secondary function.

The Cadre system recognises this need and to sustain a capacity and capability designates a regular secondary function to staff who have been trained in a competence within the contingency plan. Staff so designated are kept at a level of proficiency and awareness and listed so that they can be readily rostered.

The Cadre system allows people to gain experience and generates flexibility as staff become distributed across a range of duties. It also provides for an easy rostering and call-out scheme. A Cadre scheme must be managed in order to sustain capacity and to ensure skills levels are updated and maintained. Some roles will be frequently mobilised and competence sustained operationally; those least rostered need to be trained more frequently. The essence of SIMF is, in part, to overcome the likelihood that the first hours in a crisis will be chaotic until a regime is established. If key staff know their functions and can take the initiative with limited briefing and be rapidly assembled, order can be shaped from confusion. A Cadre system constitutes resilience; limits training costs and generates flexibility.

Specialist Advisors

There is a requirement for the role of Specialist Adviser where specialist knowledge is necessary. Specialist advisers have specialist knowledge and will be able to offer an informed view about options. They must be trained to offer reasoned evaluations in support of decision making, but they are not decision makers and Commanders should consider their advice in the wider context. Specialist advice should never be presented as a single option but, rather, should be an expert evaluation of the options under consideration.

Incident Call Handling and Control Centres

The first point of discovery of an incident or event having taken place on the Strategic Road Network can be by a report to a Agency Regional Control Centre (RCC), detection by a RCC Operator through use of CCTV, through the observations of a Agency Traffic Officer on patrol or by an Agency service provider. In any case the RCC is the first point at which a management intervention can be made. It is the facility that enables the flow of information, instructions, requirements and requests relating to the incident. It is also likely to be the first point that any potentially significant event is recognised. Thus the RCC has a key role to play within the SIMF.

On receipt of a call at RCC, it is likely that the call will be classified according to the speed of response required that is:

- Immediate
- Prompt,
- Routine,
- Deferred,
- Non-attendance.

However, this classification merely presents a single-faceted view of the situation and does not realistically reflect the complexity of many situations. Consequently, to enable the Agency and other organisations including the Police to understand fully the dimensions and dynamics of an incident or event it is necessary to assess an incident from a number of dimensions. The key to this process is information and acting decisively upon receipt of the information in a structured, coordinated and systematic way.

Incident Initial Response

In the case of planned events it is likely that a Strategic or Tactical (top down) approach will be adopted with structures and command arrangements already in place.

Incidents are likely to be handled at the Operational level (bottom up) in the first instance therefore it falls to the initial call handler or the first person from a responding organisation on the scene to take initial actions acquire key information and make some initial decisions. It is these incidents, the majority of which could be termed as routine that form the base line of the Agency response work. However, it is incidents of a more serious or critical nature that require careful and systematic handling.

The key to achieving resolution and meeting objectives is having accurate information and obtaining a clear understanding of the situation. As the incident or event develops the operational lead at the scene and the call handlers must re-evaluate the situation. Their purpose at this point in addition to providing an open and unhindered line of communication to the scene is to ensure all the required resources with the appropriate command, control and support frameworks are in place. The RCC must have in place procedures which will “**trigger**” an enhanced or escalating response as the scale of the emerging incident is recognised.

The call handler acting on the advice of the lead officer at the scene will need to give the RCC Supervisor a clear picture of the situation. This person, working within this framework and the information provided will have to decide if the current level of response is appropriate or whether to escalate or de-escalate the level of response.

This responsibility for escalation rests in the short term with the RCC Supervisor. RCC Supervisors must be familiar with escalation procedures and given the complexity of call out arrangements there should be well rehearsed procedures with cascading levels of notification to generate an enhanced response. They must be empowered to escalate events if in their judgement it is appropriate to do so. The framework to make this decision is in this document, but a knowledge of the service provider and regional contingency plans will assist.

The decision to escalate is not based on a scientific formula. If decisions are taken to an inflexible formula the system will break down.

Good decision-making requires:

- Information
- Understanding
- Adaptability
- Flexibility
- Clarity
- Judgement

Judgement is a process of reasoning - a means of deciding how the general rules can best be applied in the circumstances. It is informed by experience.

Therefore escalation is not merely a mechanical response. The SIMF places the RCC Supervisor in a position to exercise control, but command at any level also involves leadership and perspective. The RCC Supervisor must balance competing demands in a complex environment and because of this and their ultimate accountability, they will find it advantageous to operate according to a set of principles.

It is on initial receipt of the first level of information that the first decisions on scale and escalation of the response will be made. These decisions will need to be reviewed in light of additional information or changing circumstance.

Incident Escalation Framework

Escalation Decision Considerations	
T ime	Nature of Incident Public impact Resolution Resource availability
R esponsibilities of Agency	Safety of Public Safety of Responders Other incidents Congestion
A lternatives	Routes Actions Resources Remedies
C redibility Capability and Capacity	Agency Other Responders
K nowledge	Network Area Disruptions Works Weather

Incidents should be commanded at the lowest level where the Commander has the empowerment, competencies and resources to affect a resolution.

To help inform the decision to escalate or not, the issues in the proceeding table should be considered. The decisions to escalate the command of an incident must be made against the level of risk, the probability of the risk occurring and an assessment of the overall impact of the incident. Please see Appendix A, the Incident Impact Criteria table from the Agency National Crisis Management Plan.

The RCC will act as the resourcing and communications centre in any incident until any separate command and control arrangements are in place.

Incident Control Points and Centres

Where an incident is escalated it may be necessary to have additional command and control facilities that can provide a dedicated focus to:

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- The incident,
- Part of the incident
- A specific function
- A specific location

Some general principles apply in relation to all control points:

- If established, they must remain manned at times designated by Gold.
- Dedicated command channels must allow Commanders to communicate regardless of background traffic.
- Control points must be secure from the physical invasion of the incident and access must be tightly controlled to authorised persons only.
- Tight radio disciplines must be observed

In the case of incidents involving more than one agency it is probable that one of the Emergency Services (as a Category One responder) may have established one or all of the following points. In the case of a Agency Led incident or where the Agency is first on scene the Agency should consider establishing the following, if required. This may require consultation and communication with other responder organisations.

Rendezvous Point – (RVP)

Rendezvous Point (RVP)

A Rendezvous Point is a designated meeting location which allows for controlled access between incident zones on prescribed routes. It will fall under the remit of a Bronze Commander and will be a point of command and control.

Forward Control Point (Bronze Control)

In some circumstances, usually where there is danger associated with the incident, it is necessary to establish a Forward Control Point (FCP) within the ambit of Silver where immediate actions around the scene are controlled on a separate radio network or channel. An FCP is also used when strict control on entry and departure to an incident scene. A communications link is necessary to ensure that all organisations engaged in resolving the incident are aware of each others activities.

Incident Control Post (Silver Control)

The Incident Control Post (ICP) - often referred to as “Silver Control”, is a dedicated command and control function which carries out at Silver the functions which would have been carried out by the Major Incident Control Room (MICR) when the latter has not been activated. In the event of an MICR being activated ICP will assume command and control functions within a prescribed zone of deployment. The Agency ICP should normally be located at the RCC covering the incident, but may at the decision of the Agency Commander be located at the most appropriate point to enable effective incident management and resolution.

Major Incident Control Room (Gold Control)

A Major Incident Control Room (MICR) is established where Gold control assumes an active role. Its function is to:

- Provide liaison and command or control synchronising and information exchange with other Emergency Services.
- Handle calls from the public relating to the incident.
- Liaise with the Regional Control Centre regarding other business and contingencies.

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The use of individual Regional command and control technology will provide infrastructure that will fulfil this function in respect of “command” of the incident.

Control Centre Resources

All control centres will require specific resources to enable them to carry out their function. These resources may include:

People

- Radio controllers
- Computer operators
- Call handlers
- CCTV operators
- Supply and Support function staff
- Administrative staff including Decision Log writers

Hardware

- Command and Control terminals
- Computer facilities including internet
- Fax machines
- Radio Communications including Command Band Network Channel
- Telephone lines
 - Mobile telephones
- Heli Tele in liaison with the local police
- CCTV feed
 - Area maps
- TV and radio receivers with access to SKY news
- Dry wipe boards and pens

Definitions

The police, other emergency services and local authorities have an established understanding of the terms ‘Emergency’ and ‘Major Incidents.’ The terms are used by Government to take powers to deal with such incidents.

The police or other emergency services will usually declare an Emergency or major incident and notify the Agency through the Regional Control Centre or the National Traffic Control Centre.

The term ‘critical incidents’ has also been established for those incidents that are important to a single organization. The term ‘incident’ should be regarded as the description of those occurrences that come to the attention of the Highways Agency and its’ service providers.

Major Incident

Major Incidents are any Emergencies that require the implementation of special arrangements by one or more of the emergency services, the NHS or the local authority for:

- The rescue and transport of a large number of casualties.
- The involvement either directly or indirectly of large numbers of people.
- The handling of a large number of enquiries likely to be generated both from the public and the news media usually to the Police.
- The large scale deployment of the combined resources of the emergency services.
- The mobilisation and organization of the emergency services and supporting organizations, e.g. Local Authority, to cater for the threat of death, serious injury or homelessness to a large number of people.

Emergency

This is a term that has been defined by Government and covers any challenges that present a serious threat to:

- Human welfare
- The environment
- Political, administrative or economic welfare
- The security of the UK

It includes the process of restoring and rebuilding the community in the aftermath of an incident. (Civil Contingencies Act 2004).

Critical Incident

Critical incidents are unforeseen events that seriously impact upon the Highways Agency and its ability to deliver its aim of 'safe roads, reliable journeys, informed travellers'. Importantly, the police, other emergency services or local authorities may not regard the incident in the same light and therefore may not implement the same level of response to a critical incident as the Highways Agency.

Critical incident

The following are deemed to be critical incidents:

1. Multiple collisions involving fatalities, serious injuries or vehicles disabled on a carriageway
2. Partial or full closure of motorways or trunk roads due to weather or road conditions. This will also include minor incidents occurring at differing locations aggravated by other circumstances, which taken as a whole fall into this category
3. Collisions involving crossover of a vehicle from one carriageway to another
4. Collisions involving passenger coaches, school minibuses, trains, or public service vehicles resulting in fatalities or injuries
5. Fatal collisions involving fire
6. Serious collisions involving a vehicle carrying dangerous substances (e.g. hazardous chemicals, flammable liquids such as petrol, radioactive materials, etc)
7. Collisions on motorways or trunk roads resulting in serious/potentially serious structural damage (e.g. to a bridge) necessitating road closures
8. Fatal collisions on motorways or trunk roads where road works are in progress
9. Any significant event impacting partial or full closure of motorways or trunk roads due to collisions, security alerts or criminal/terrorist acts
10. Any incident off or adjacent to the network that may meet any of the above criteria, and effects the network
11. Suicide or attempted suicide resulting on the closure of lanes or carriageways
12. Roadworks over running by 30 minutes or more, and likely to have an impact on the network

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Glossary

COBR - Cabinet Office Briefing Room, where the government response to an emergency or crisis is managed.

Control Room - Centre for the control of the movements and activities of each emergency service's personnel and equipment. Liaises with the other services control rooms.

Cordon - Surrounds and protects the immediate scene of an accident.

Crisis Management Team (CMT) - The CMT will act to ensure that the Agency can continue to exercise its core functions by limiting the impact of a crisis or major incident in the event of an emergency, so far as is reasonably practicable.

DBFO - Design, Build, Finance, Operate, Refer to Service Provider

DfT - Department for Transport.

DRA - Dynamic Risk Assessment.

EMAC - Enhanced Managing Agent Contractor.

Forward Control Point (FCP) - Each service's command and control facility nearest the scene of the incident - responsible for immediate direction, deployment and security.

GNN - Government News Network

HAIL - Highways Agency Information Line

Heli Tele - Police Helicopter mounted video recording equipment with air to ground link which, with agreement from Police, allows pictures of incidents to be transmitted to control rooms or command suites.

Incident Control Point / Post - The point from which each of the emergency services tactical managers can control their services' response to an incident. Together, the incident control points form the focal point for co-ordinating all activities on site. Also referred to as 'Silver control'.

Incident Support Unit (ISU) - Service Provider/TMC personnel providing a first response 24/7 capability for any incident. They assess if any Emergency Call-Out Resources are required (in addition to the limited resources which they carry) and arrange for these to be provided through the Network Control Centre.

Inner Cordon - Surrounds and protects the immediate scene of an incident.

Major Incident Control Room - Established in protracted emergencies to co-ordinate the overall response, deal with ongoing resources and logistical requirements and provide facilities for senior command functions. Often referred to as 'Gold Control'.

Managing Agent (MA) or Managing Agent Contractor (MAC) - Refer to Service Provider

Marshalling Area - Area to which resources and personnel not immediately required at the scene or being held for further use can be directed to standby.

Media Centre / Media Briefing Centre - Central location for media enquiries, providing communication, conference and monitoring facilities, interview and briefing, access to responding organisation personnel staffed by spokespersons from all principal services/organisations responding.

Media Liaison Officer - Representative who has responsibility for liaising with the media on behalf of their organisation.

Media Liaison Point - An area adjacent to the scene which is designated for the reception and accreditation of media personnel for briefing on arrangements for reporting, filming and photographing, staffed by media liaison officers from appropriate services.

Mutual Aid Arrangements - Cross-boundary arrangements under which the Traffic Officer Service and Service Providers request extra staff and/or equipment.

NAR - Network Access Resilience.

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NCMP - National Crisis Management Plan. See CMT.

NGF - National guidance framework.

National Incident Liaison Officer (NILO) - HA member of staff based at the NTCC available 24/7/365 to receive information about critical and major incidents and to disseminate information within the Agency and DfT as necessary.

National Traffic Control Centre (NTCC) - Control centre based in the Midlands to collect and disseminate information on road conditions and traffic flow for whole of England and set strategic diversion routes.

Network Control Centre (NCC) - The Service Providers 24 hour communications centre.

NIM - National Intelligence Model.

Outer Cordon - Seals off a controlled area around an incident to which unauthorised persons are not allowed access.

PSA Target - Public Service Agreement Target.

Regional Control Centres (RCC) - Control centre based regionally and staffed by the Police and HA to act as a central referral point for all emergency roadside services and monitors the network using roadside technology.

Rendezvous Point (RVP) - Point at which all resources arriving at the outer cordon are directed for logging, briefing, equipment issue and deployment. In protracted large-scale incidents there may be a need for more than one rendezvous point.

RIU - Regional Intelligence Units.

Senior Investigating Officer (SIO) - The senior detective officer appointed by the senior police officer to assume responsibility for all aspects of the police investigation.

Senior Officer On Call (SOOC) - Senior Highways Agency officer operating out of hours on a rota to deal with strategic management of incidents when/if contacted by the National Incident Liaison Officer (NILO).

Service Provider - The Agency's contractor responsible for the operation and management of the network

SIMF - Standard Incident Management Framework.

SIMG - Standard Incident Management Guidance.

SIMP - Standard Incident Management Plan - includes SIMF and SIMG.

SRW - Schedule of Roadworks.

SSR - Safety Standards & Research Directorate of the Agency.

Term Maintenance Contractor (TMC) - The Agency Contractor reporting to a Managing Agent, providing works and emergency response services for the operation and management of the Agency's Area network.

TiS - Traffic Information Services – private company employed to operate the National Traffic Control Centre (NTCC).

TM - Traffic Management.

TRL - Transport Research Laboratory.

Appendix A

HA Crisis Management Plan Incident Impact Criteria

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Level	Level Description	CMT Activated	CMT Informed	Emergency Contact Procedure		Impact on Network	HA Resource Needed	Affect on HA Reputation	Media Attention towards the HA	Consider Debrief
				NILO	SOOC					
0	State of National Emergency	✓		✓	✓					✓
1	Cross Regional or National HA Major Incident	✓		✓	✓	Major impact across Regions / Nationally	Whole Agency / Significant reallocation of resources	Loss of Agency credibility	'Front page' National/ International TV/Radio	✓
2	Regional HA Major Incident		✓	✓	✓	Significant part of Strategic Road Network in Region	Reallocation of resources from other Regions	Development of Agency affected	Potential use as 'Front page' headline	✓
3	HA Major Incident		✓	✓	✓	Incident and diversion routes	Mutual aid from neighbouring Regions	Reputation materially affected	National Coverage	✓
4	Serious Incident			✓	✓	Incident and immediate vicinity	Resource covered by overtime	National reputation may be affected	Of interest to National Media	✓
5	Significant Incident					Incident	Local shift resource	Loss of local goodwill	Of interest to Local Media only	
6	Routine Incident					Minimal	HA Vehicle/ISU on Scene	No affect	No interest to media	

Annex 7.8.12 Service Provider Contingency Plan Model Document

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If you receive a copy of this plan, you must:

Read and understand it
Identify the role you have to play
and be prepared to undertake the actions
ascribed to you

Name of Service Provider
Address of Service Provider
Telephone number of Service Provider
Fax number of Service Provider

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Issue and Revision Record

Rev	Date	Originator	Checker	Approver	Description
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Insert details to suit Service Provider's Quality Assurance System. Insert any disclaimers required.

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Executive Summary

This is the Contingency Plan for Area XXX.

It explains how the Area will escalate its Standard Incident Response from Operational Level (Bronze) to Tactical (Silver) and Strategic (Gold) levels when that is necessary.

This will ensure the most robust response possible to any level of emergency or disruption to network operations.

The plan has been written in accordance with the Highways Agency’s (HA) Model Document for Area Service Provider Contingency Plans and has been approved by the HA’s Area Performance Manager.

The plan is updated at quarterly intervals.

1.0 PURPOSE OF THE PLAN

1.1 Introduction

This Plan explains how the Service Provider will escalate an incident response from Operational (**Bronze**) to Tactical (**Silver**) and Strategic (**Gold**) levels on occasions when needed.

The Plan refers to the Highway network shown in **Figure 1.3**. It refers to incidents affecting that network, whether occurring on or off it.

1.2 Structure of the Plan

The Plan is in three parts:

- this Document, setting out the escalated response to a Major or Critical Incident, or Civil Emergency, referred to as the “Main Document”
- Tactical Diversion Route Document
- a Box of Reference which contains a wide range of information that may be needed by the Tactical Management Team managing an incident.

1.2.1 Scope of the Main Document

The Main Document contains the following:

Section 1	Purpose of the plan - the scope and the structure of the Plan.
Section 2	Key Stages of the plan - the high level stages of the mobilisation of the Plan.
Section 3	Roles and Responsibilities the roles and responsibilities of the parties who may be involved in an incident.
Section 4	Stage 1 of Contingency Plan - Links between the Service Provider's established Bronze Control Incident Response procedures and explains how they link in to the Contingency Plan.
Section 5	Stage 2 of Contingency Plan - This section explains the Partial implementation of the Plan involving enhanced communications only.
Section 6	Stage 3 of Contingency Plan - The full implementation of the Plan to Silver control, including establishment of a Tactical Management Team (TMT) located in a Tactical Management Room (TMR).
Section 7	Stage 4 of Contingency Plan - Escalation of management of the incident is escalated to the RCC if necessary.
Section 8	Stage 5 of Contingency Plan - The further escalation to the HA Crisis Management Team if necessary.
Section 9	Stage 6 of Contingency Plan - De-escalation of Incident Control
Section 10	Stage 7 of Contingency Plan - The structured debrief following Plan implementation.
Section 11	Stage 8 of Contingency Plan - How lessons can be learned from incidents.
Section 12	Stage 13 of the Contingency Plan – Lessons learned
Section 13	The Diversion Route Document (DRD).
Section 14	Management of the Plan.
Section 15	Plan Management

1.2.2 Tactical Diversion Route Document (DRD)

The Diversion Route Document (DRD) contains details of Tactical Diversion Routes to be used in the event of an incident on or off the Strategic Network closing a section of HA road, along with

other information required and identified by the guidance at 7.6.4 of the Network Management Manual (previously issued as AMM 71/06).
The contents of the DRD are specified in **Section 13** in this document.

1.2.3 Box of Reference

This box contains Major Stakeholder Contingency Plans and other reference information that the Tactical Management Team may require to manage an incident on or off the strategic network.

1.3 Glossary of Terms within the Plan

A list of terms which are used throughout the Plan is stored in **Appendix E** for reference.

1.4 Scope of the Contingency Plan

The Plan covers the actions to be taken by the Service Provider in escalating response to an incident, and interfaces between the Service Provider and other organisations.

In general, the emergency services will take control of any serious incident. This Plan is designed to ensure that the Service Provider is able to make a proper response to the situation in order to:

- support the actions and requests of the emergency services
- ensure that proper interfaces are achieved with other organisations
- ensure that nuisance to HA's customers and Major Stakeholders is minimised
- escalate management of the response to a higher level if necessary

A.

The Plan is designed to ensure that:

- in such circumstances, the right members of the Service Provider are in the right place at the right time
- they are aware of their individual responsibilities, decisions and actions they have to take
- they have the information and resources necessary to make these decisions and undertake these actions in a timely and efficient way.

1.5 Escalation of Incident Response

There are separate but related Contingency Plans for:

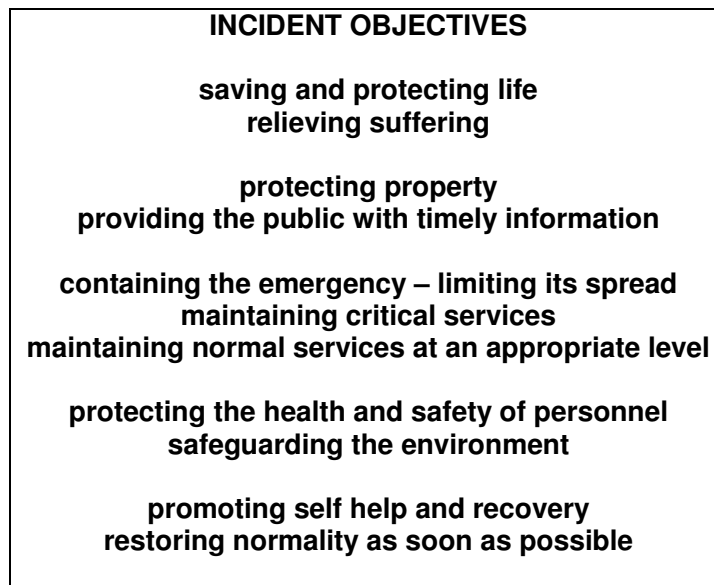
- the Service Provider
- the RCC
- the Highways Agency's National Crisis Management Team (CMT)

These Plans allow for the management of incident response to be escalated from the Service Provider to the RCC and to the CMT when circumstances require it. Each plan explains how the organisation will escalate and manage its response to an incident when it has that responsibility, and the functions it will perform when that responsibility lies elsewhere.

- Management of the response is escalated when any of the common Incident Objectives (see below) are threatened at the current level of management.

1.6 Common Incident Objectives

The Incident Objectives listed below are common objectives for all agencies involved in managing an incident. All involved in implementing the Plan must be aware of the objectives set out in this section and strive to maximise support for them.



These objectives embrace more than simply dealing with the incident itself, repairing damaged infrastructure and reopening the network. Particular attention is drawn to objectives relating to informing the public and safeguarding the environment.

In addition, there are two further common objectives which are essential in managing an incident, but which are not considered critical to the implementation of the Contingency Plan:



1.7 Highways Agency Objectives

The Highways Agency (including the Service Provider) will give full support to the Emergency Services in attaining all the common Incident Objectives, but will have a particular focus on objectives relating to its Customers First agenda:

- Avoid undue impact on surrounding area
- Minimise the impact of the incident on the travelling public;
- Collate information for onward transmission to road users, Major Stakeholders, and other interested parties e.g. Government
- Restore the network to normal conditions as quickly as possible

1.8 Contingency Plan Escalation Procedure

1.8.1 Introduction

The Contingency Plan is implemented when the Service Provider's standard Incident Response procedures are unable to contain an incident or its effects, to the extent that any of the common **Incident Objectives** are threatened.

The Contingency Plan will be implemented in circumstances when the Service Provider's Standard Incident Response procedures are unable to stabilise a situation and the situation is likely to deteriorate further and become out of control without tactical or strategic intervention.

Figure 1.1 shows a high level overview of the escalation procedure. It shows how incident response is escalated from Bronze through Silver to Gold Levels. Triggers for implementing the Contingency Plan (at various levels) are shown in red.

Bronze (Operational Management by the Service Provider)

The incident is managed by the Service Provider using Standard Incident Response procedures.

Silver (Tactical Management by the Service Provider)

The Service Provider mobilises the Tactical Management Team and sets up the Tactical Management Room to manage the incident.

Gold (Strategic Management by the Service Provider)

The Service Provider mobilises the Senior Management Team and sets up Gold Command.

Gold (Strategic Management by the HA RCC)

Strategic management of the incident passes to the RCC. Details of how they operate can be found in the RCC Contingency Plan and the wider actions to be taken within the HA at this level are set out in HA's Standard Incident Management Framework Document (SIMF)

Gold (Strategic Management at a national level by HA's National Crisis Management Team (CMT))

Strategic management of the incident passes to the CMT. Details of how it operates can be found in the National Crisis Management Plan

1.8.2 Gold, Silver and Bronze

It should be noted that Silver level command by an RCC and Gold level by the CMT in this context is relative to the Service Provider's and may not necessarily require Gold level command in absolute terms within either organisation. This might be more appropriate for, say, a crisis within the Highways Agency not involving the Service Provider. Equally, an RCC, for example, would probably be operating at no higher than Silver level command within its own Contingency Plan, but would be providing Gold level command for the Service Provider.

Figure 1.2 illustrates this point, and shows how a Gold-Silver-Bronze command structure can be provided in different circumstances with different organisations at different levels of control within their own Contingency Plans.

1.9 Interface with Regional Control Centre (RCC) Contingency Plans

The Plan is consistent with the HA's XXX Region – Regional Control Centre Contingency Plan dated XXX.

The RCC Plan adopts the same procedures and terminology, and embodies the actions specified for RCC in this Plan.

1.10 Plan Holders

Plan holders are the relevant persons who may be involved in some part of the incident management process or may be affected by the effects of the incident. Plan holders' names, contact details etc are given in **Appendix A** of this Plan.

1.11 Statement of Robustness

This plan complies with the following robustness criteria:

- The Plan has been reviewed by the HA's Area Performance Manager
- The Plan demonstrates an understanding of the roles and capabilities of the emergency services, the local highway authorities, HA Area Team, RCC and the Service Provider interfaces with them.
- Contact has been made with each local authority, emergency service and stakeholder listed in the Box of Reference.

1.12 Incident Definitions

HA have established definitions of Major and Critical incidents. These are in Appendices C and D of this plan.

Figure 1.1: High Level overview of escalation procedure

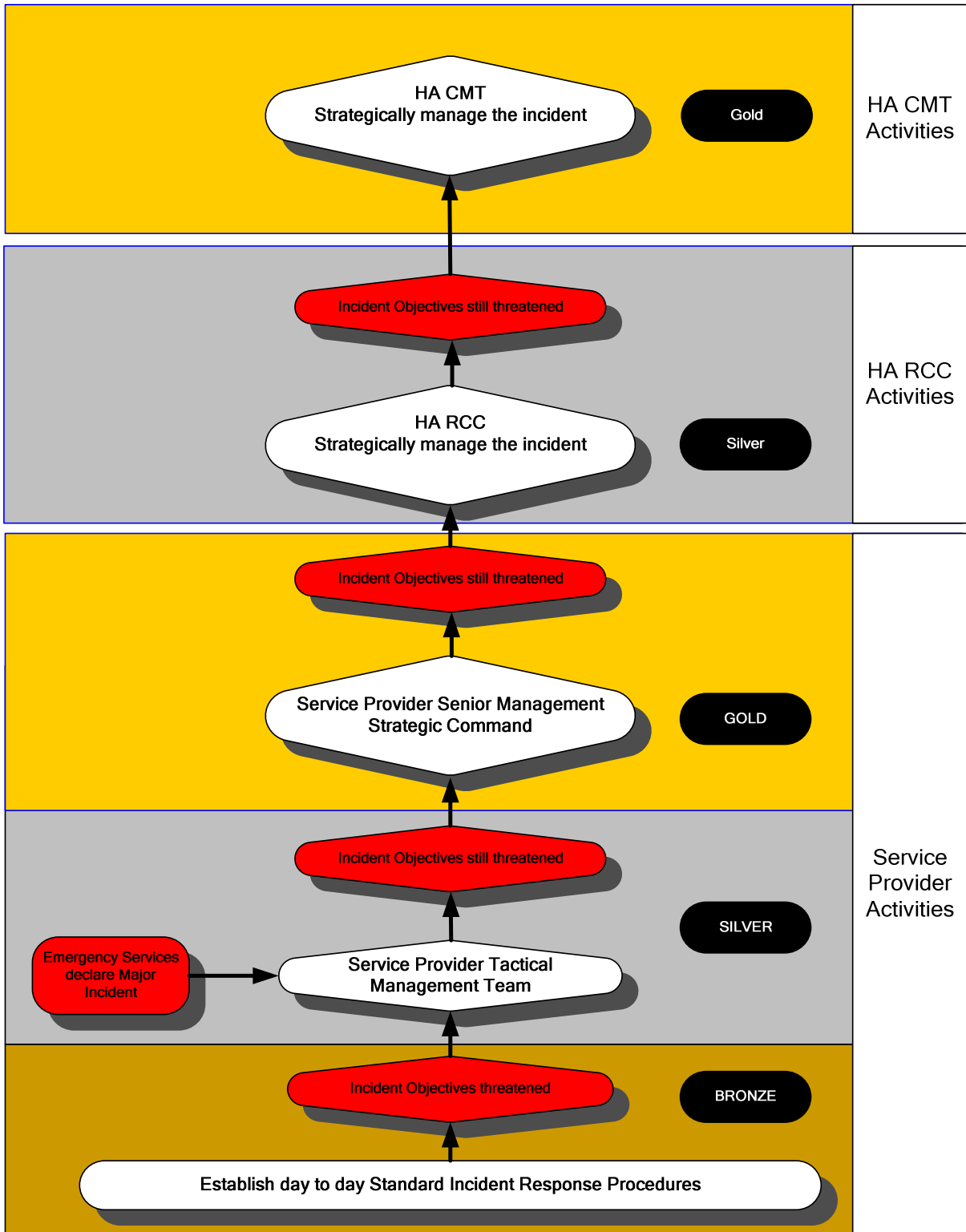


Figure 1.2: Relationship between Service Provider (SP), Regional Control Centre (RCC) and Crisis Management Team (CMT) levels of Incident Command

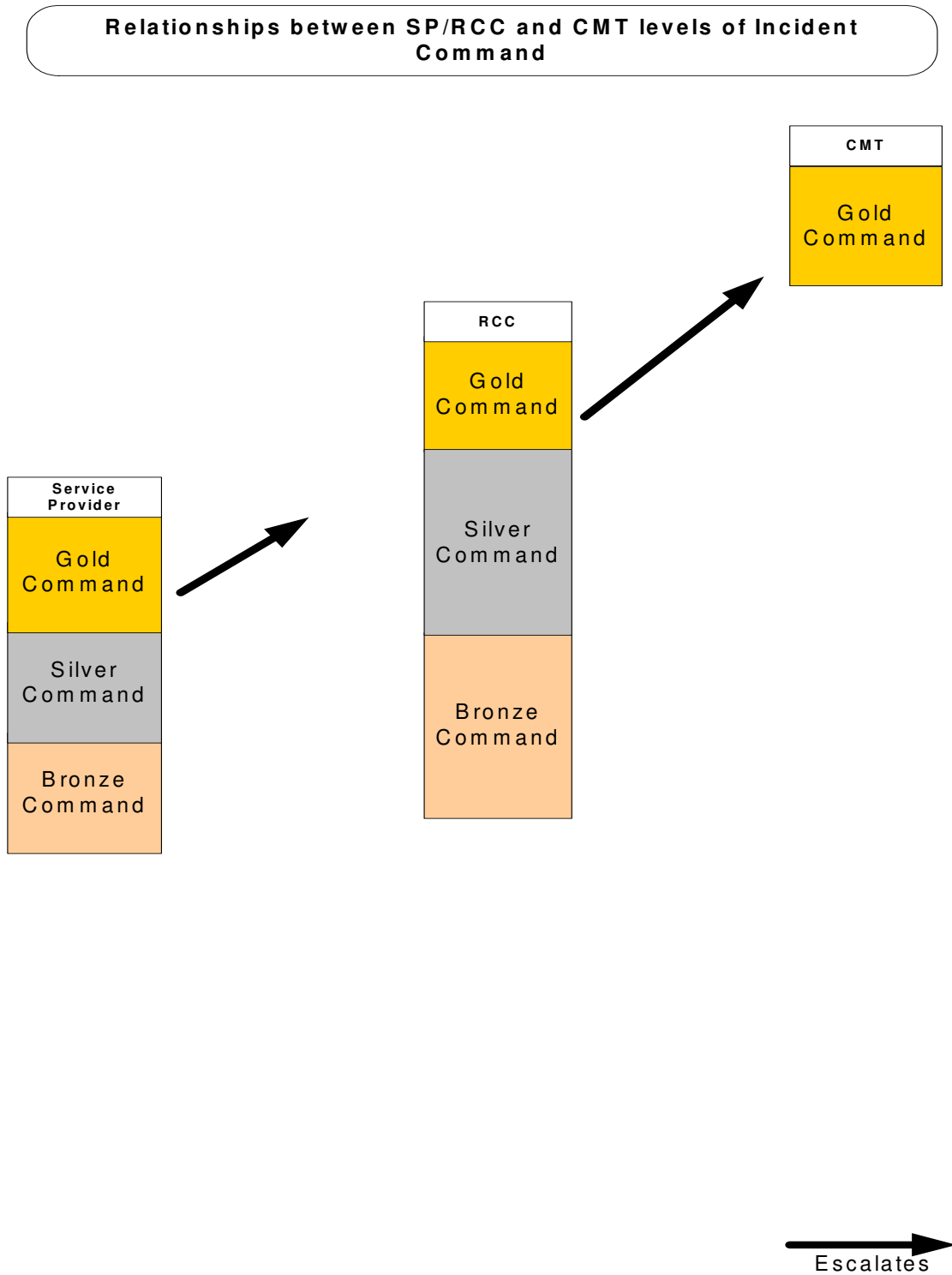


Figure 1.3: Service Provider Area Map

A map showing the roads and boundaries of the Service Provider's HA Network Area is to be included here, also showing the RCC responsible for each part of the network.

2.0 KEY STAGES OF PLAN

2.1 Introduction

Implementation of the Contingency Plan comprises a number of different stages at different levels of control (Bronze, Silver and Gold).

The figures in this section show different ways in which the Plan can be implemented. They illustrate:

- “Bottom Up” Plan implementation when implementation of the plan is triggered by events within the Service Providers Area.
- “Top Down” Plan implementation. When implementation of the plan is by external events imposed on the Service Provider.

2.2 “Bottom-Up” Plan Implementation

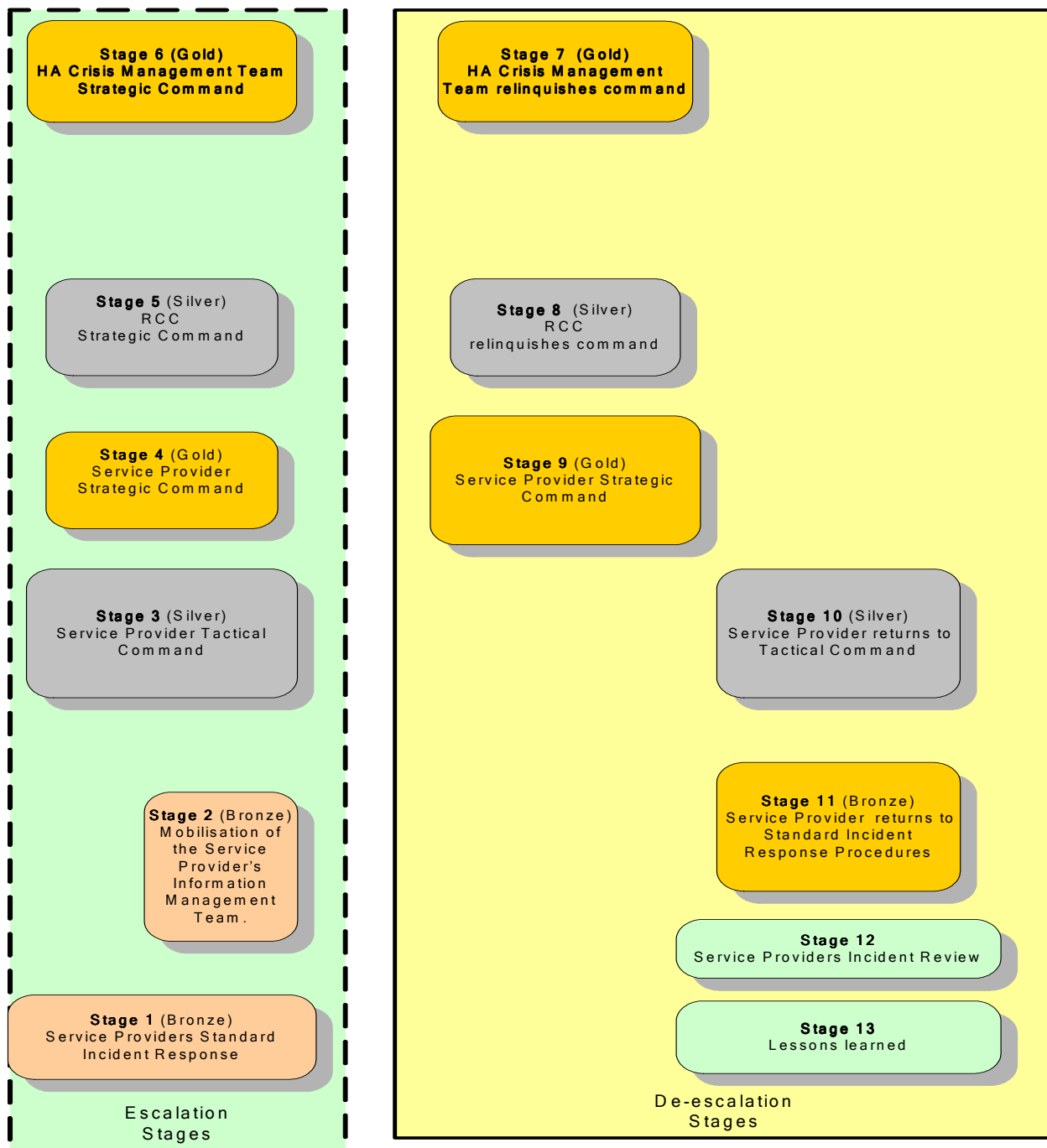
Figure 2.1 (following) shows the key stages of Contingency Plan implementation.

There are 6 escalation stages and 4 de-escalation stages, although some stages appear in both procedures. The decision to escalate or de-escalate (at each stage) depends on whether the incident objectives (**section 1.8**) are being threatened. Execution of the ten individual stages is explained in more detail in **sections 4 to 11**.

The individual stages of the Plan can be applied in different sequences, as explained below.

Figure 2.2	Sequence A
Figure 2.3	Sequence B
Figure 2.4	Sequence C
Figure 2.5	Sequence D
Figure 2.6	Sequence E
Figure 2.7	Sequence F

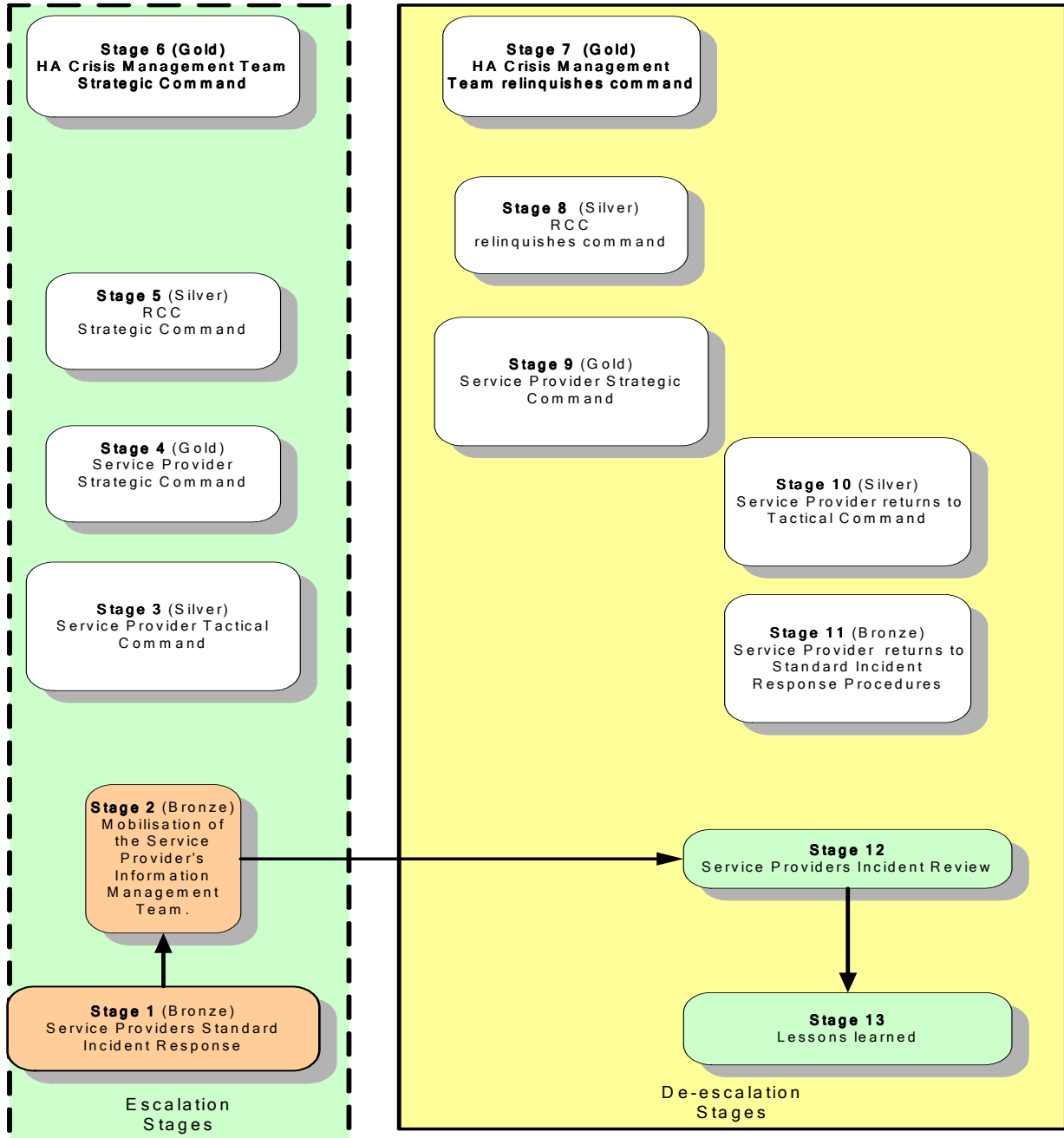
Figure 2.1: High Level diagram showing the different stages of mobilisation and de-escalation



2.3 “Bottom-Up” Plan Escalation and De-escalation

The stages of Plan implementation above refer to “bottom-up” Plan escalation triggered by events within the Service Provider’s Area. Depending on the level of escalation needed or how the escalation is triggered, there are six alternative sequences to implementing the Contingency Plan. In each case, the corresponding de-escalation stages are also included.

Figure 2.2: Sequence A

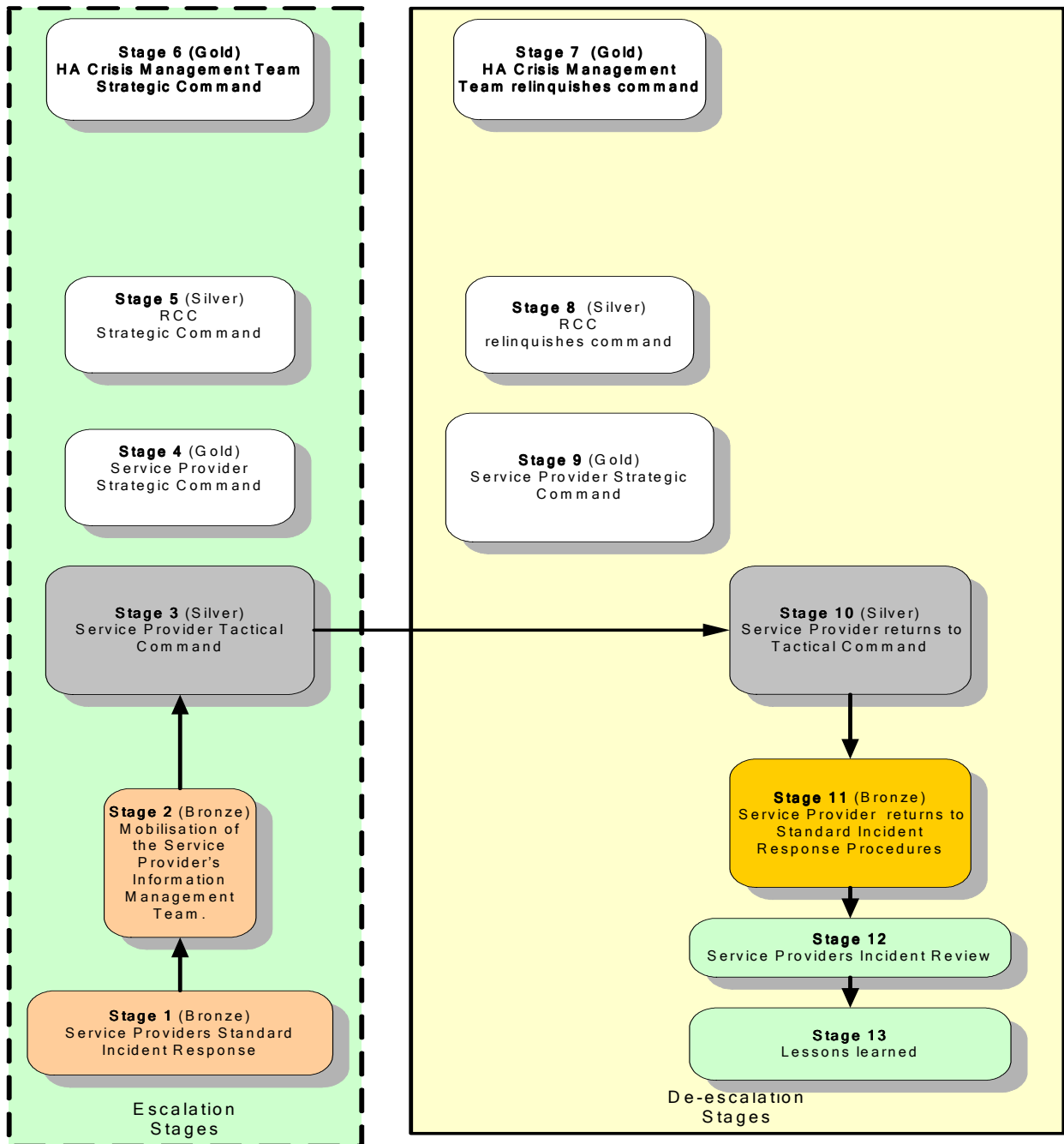


2.3.1 Sequence A Bronze (Stages 1, 2, 12 and 13)

(Mobilisation of Service Provider’s Information management Team (IMT))

Service Provider’s Standard Incident Response Plans are able to deal with incident at an operational level, but there is a need to enhance the communications transmitted to the HA, media and stakeholders. The Plan is partially implemented to mobilise the Service Provider’s IMT only.

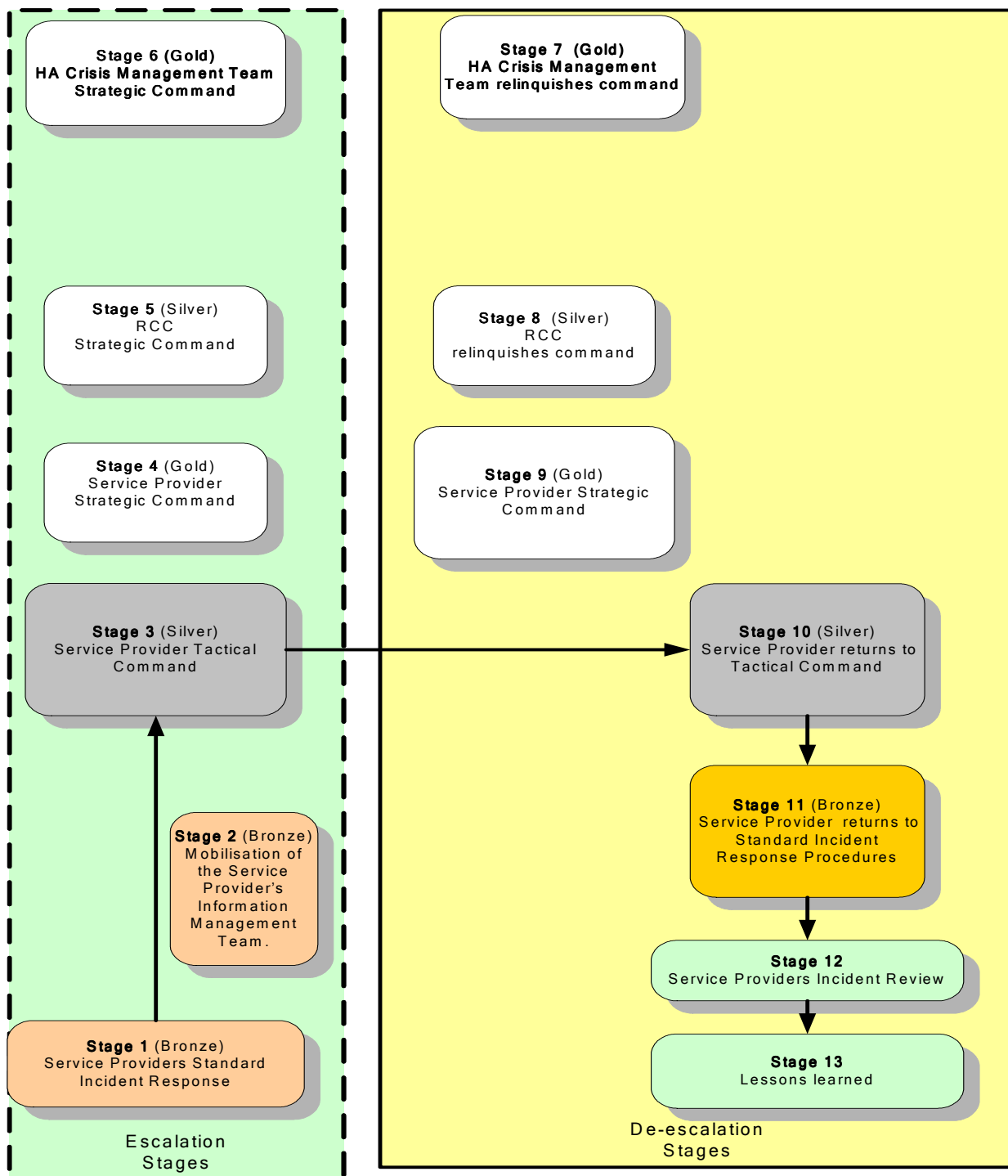
Figure 2.3: Sequence B



**2.3.2 Sequence B Silver (Stages 1, 2, 3, 10, 11, 12 and 13)
(Service Provider Tactical control)**

This shows the incident escalating to Service Provider tactical control as the situation deteriorates further. The IMT can alert others of the need to implement Stage 3.

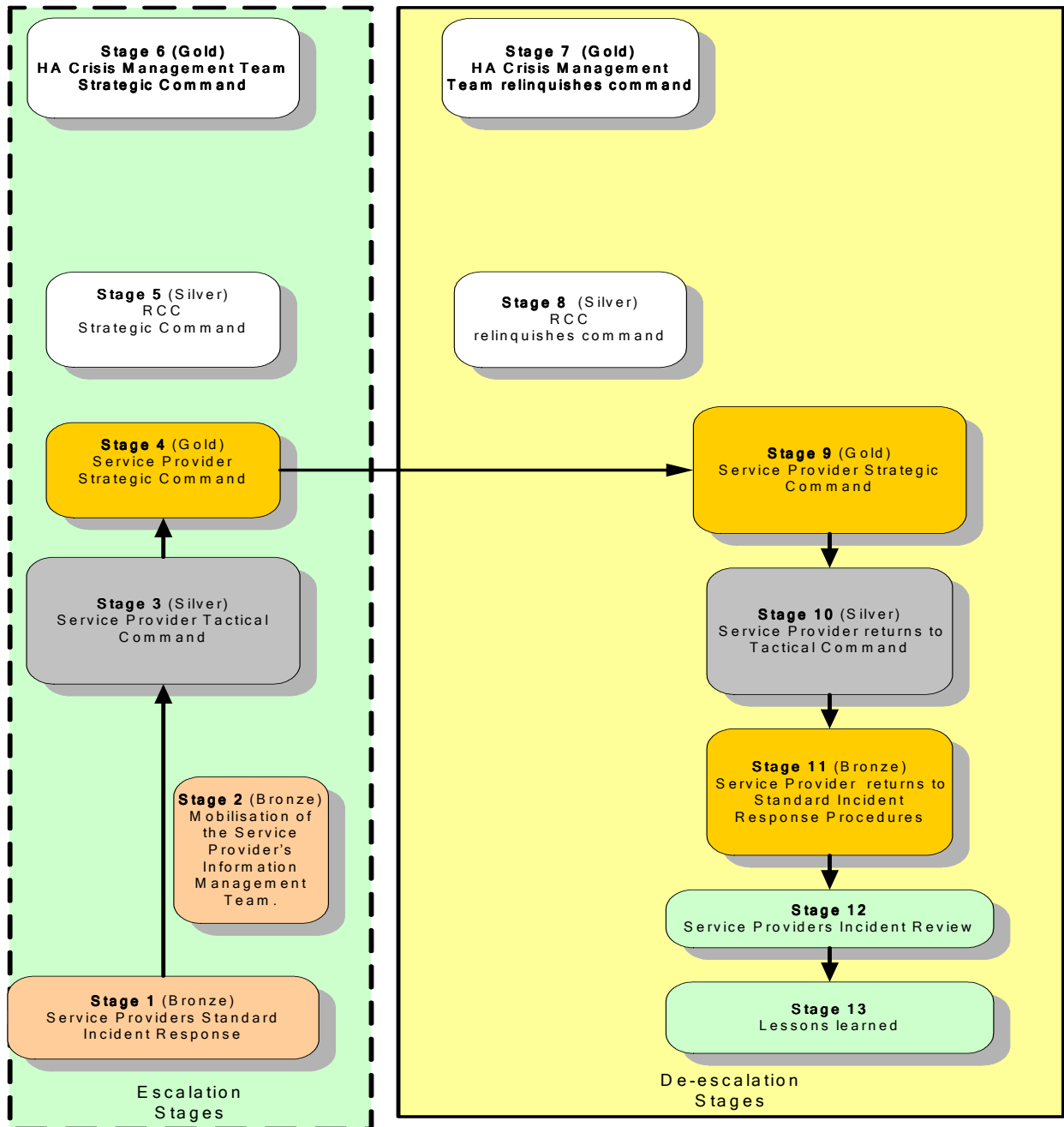
Figure 2.4: Sequence C



**2.3.3 Sequence C Silver (Stages 1, 3, 10, 11, 12 and 13)
(Service Provider Tactical Control)**

The sequence shows escalation directly to Service Provider tactical command, bypassing Stage 2 of the plan.

Figure 2.5: Sequence D

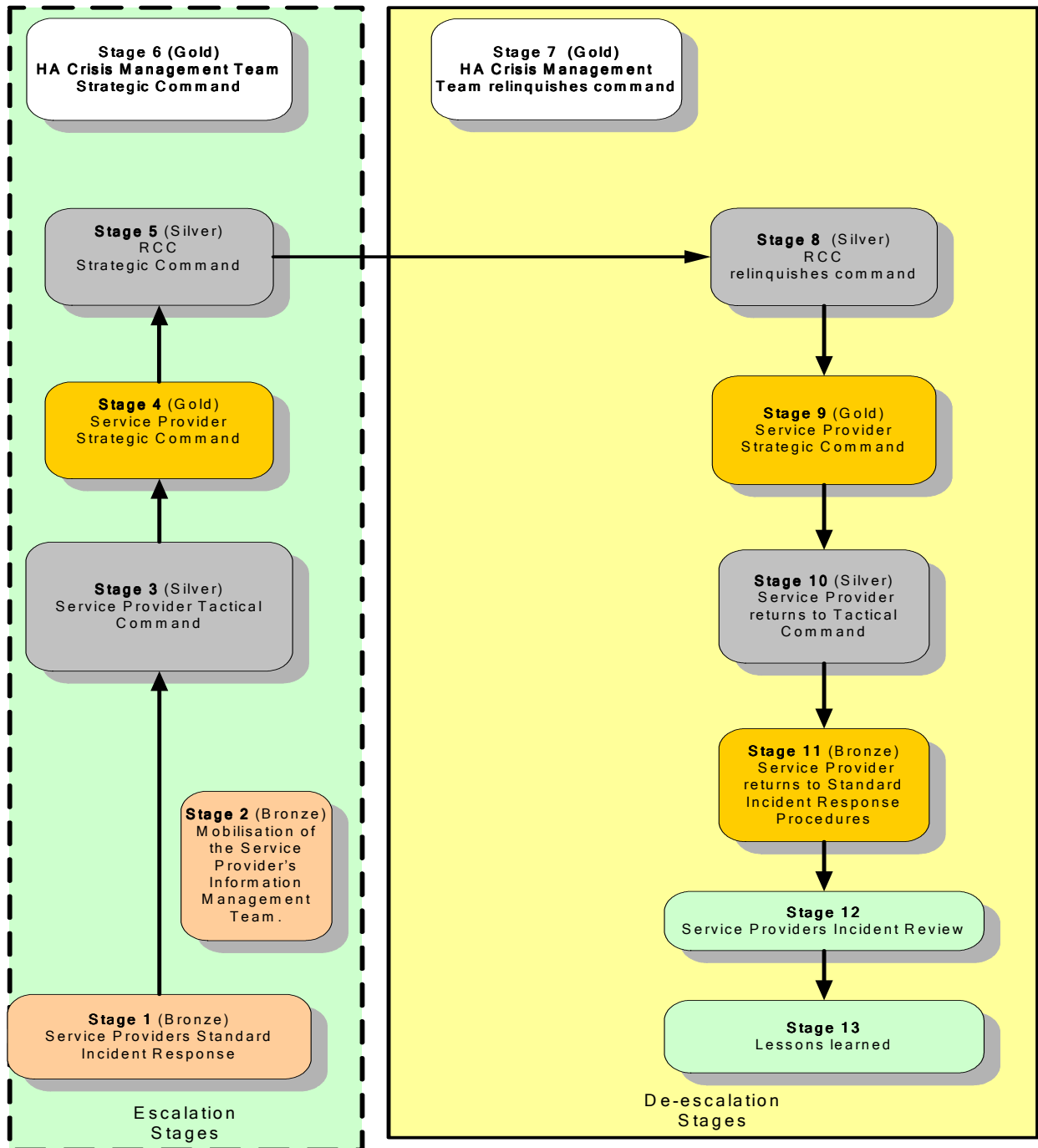


2.3.4 Sequence D Gold (Stages 1, 3, 4, 9, 10, 11, 12 and 13)

Service Provider Strategic Command

The sequence shows escalation to the Service Provider strategic command. A partial implementation of the Plan (Stage 2) could be included in the sequence if the incident develops more slowly. When the Service Provider decides that strategic command of the incident is no longer required, the Service Provider returns to tactical command Stage 3.

Figure 2.6: Sequence E

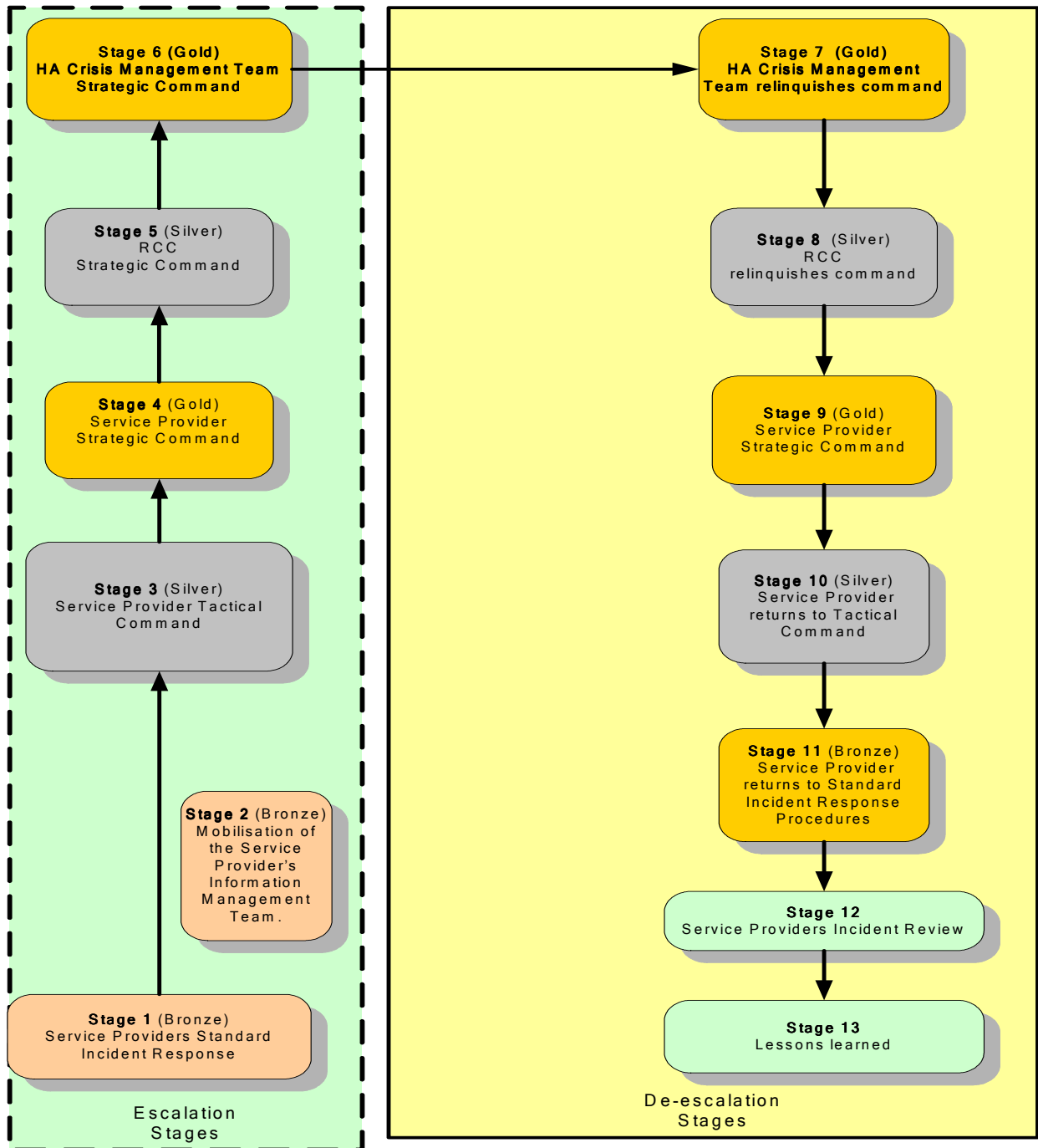


2.3.5 Sequence E Silver (Stages 1, 3, 4, 5, 8, 9, 10, 11, 12 and 13)

HA RCC Strategic Command

This sequence shows escalation up to the HA RCC Silver command. Again, a partial implementation of the Plan (Stage 2) could be included in the sequence if the incident develops more slowly. When the HA RCC Team relinquishes strategic command of the incident, the Service Provider regains strategic command and Stage 9 is implemented which has the same functions as Stage 4.

Figure 2.7: Sequence F



2.3.6 Sequence F Gold (Stages 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13)

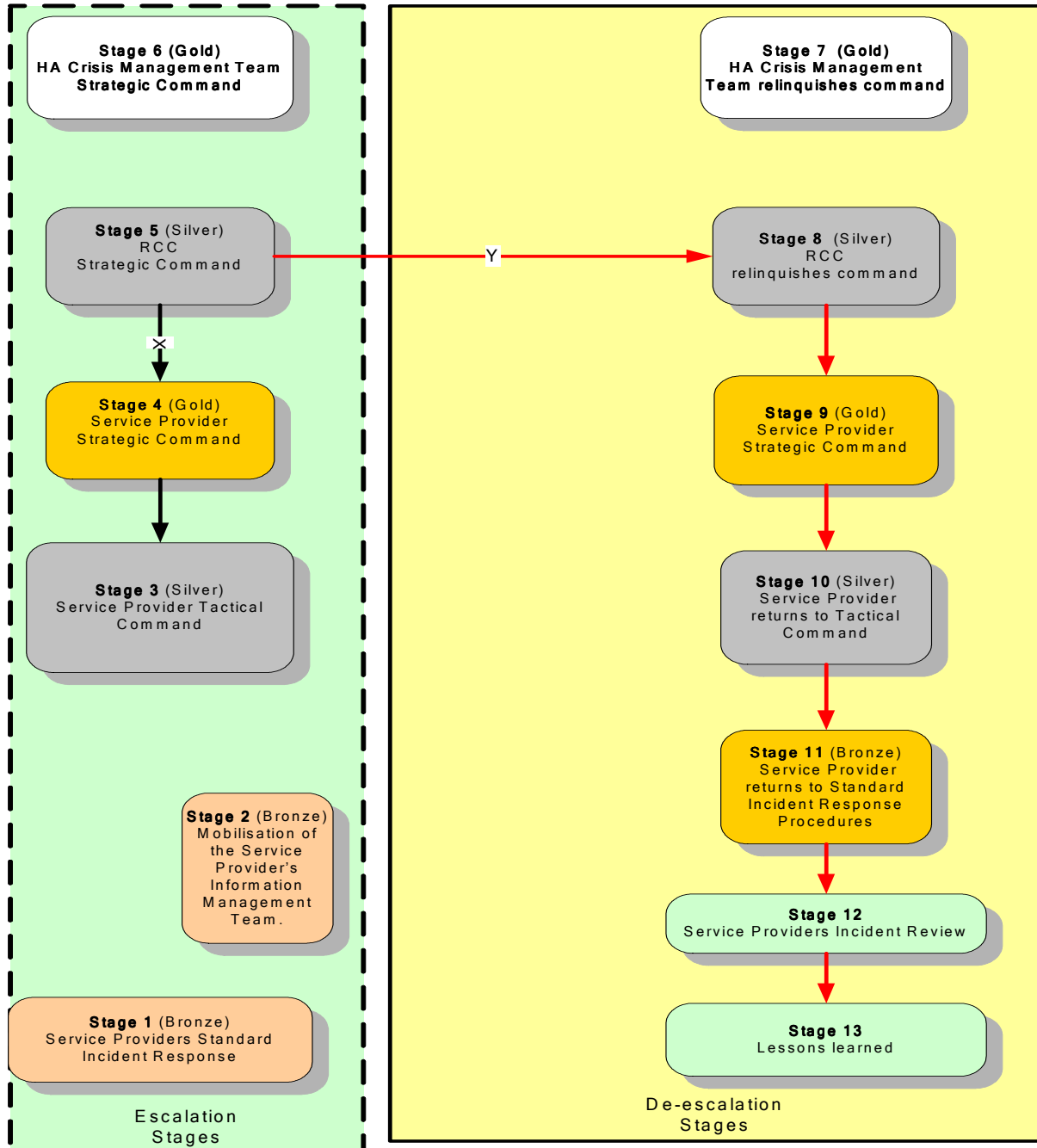
HA CMT Strategic Command

This sequence shows escalation up to the HA CMT Gold command. Again, a partial implementation of the Plan (Stage 2) could be included in the sequence if the incident develops more slowly. When the HA CMT Team relinquishes strategic command of the incident, the HA RCC regains strategic command and Stage 8 is implemented which has the same functions as Stage 5.

2.4 “Top-Down” Plan Implementation by RCC

The stages of Plan implementation above refer to “Top Down” Plan escalation triggered by events outside of the Service Provider’s Area. Depending on the level of escalation needed or how the escalation is triggered, there are two sequences to implementing the Contingency Plan. In each case, the corresponding de-escalation stages are also included.

Figure 2.8: “Top-Down” Plan Implementation by RCC



2.5 “Top-Down” Plan Implementation RCC

In other circumstances, implementation of the Service Provider’s Contingency Plan may be triggered or instructed by HA, in response to events outside the Service Provider’s Area.

2.5.1 Escalation: Sequence X: RCC Silver (Stages 5, 4 and 3)

This sequence shows how the RCC implements the Area Contingency Plan and instructs the Service Provider to set up Gold Command.

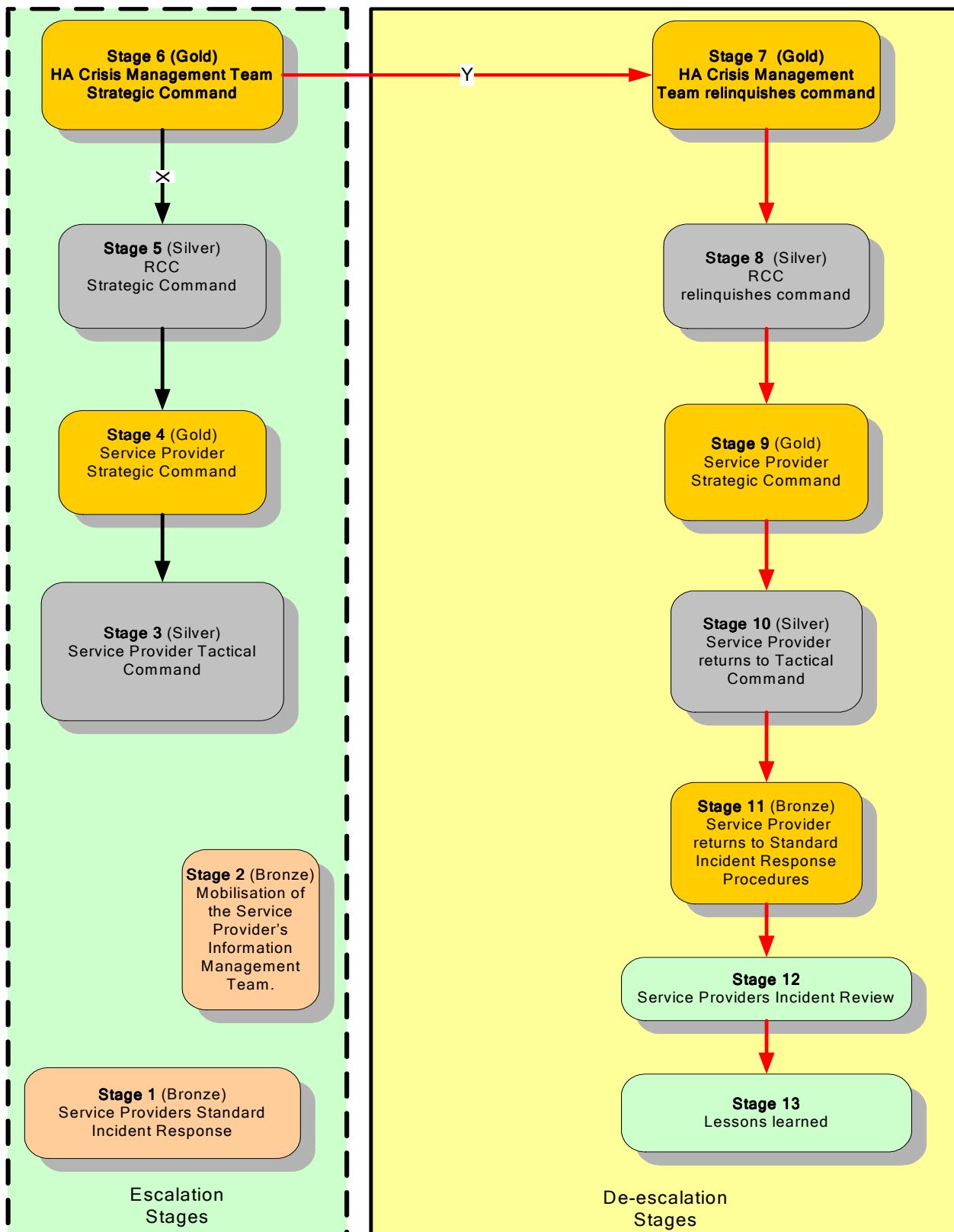
2.5.2 De-escalation: Sequence Y: RCC stands down Gold (Stages 8 to 13)

This sequence shows RCC closing down Silver command and the de-escalation process.

2.6 “Top-Down” Plan Implementation by the HA Crisis Management Team

In this situation, implementation of the Plan is instructed by the HA Crisis Management Team, set up in response to a Civil Emergency or similar.

Figure 2.9: “Top-Down” Plan Implementation by the HA Crisis Management Team



2.7 Key Sequences to HA National Crisis Management Team (CMT) implementing the Plan

2.7.1 Escalation: Sequence A: HA CMT Gold Control (Stages 6, 5, 4 and 3)

This sequence shows how the HA Crisis Management Team (CMT) implements the Contingency Plan. They pass strategic decisions down to the RCC who interprets these at a strategic level for the Area concerned. The RCC instructs the Service Provider to set up Gold command.

2.7.2 De-escalation: Sequence B: HA CMT Gold stands down (Stages 7 to 13)

This sequence shows how the HA CMT closes down its Gold command and hands strategic control of the incident to the RCC. The Service Provider retains tactical command of the incident. As the situation further eases, the RCC closes Gold command and leaves the Service Provider in tactical command.

3.0 ROLES AND RESPONSIBILITIES

The roles and responsibilities of the following players who may be involved in an incident are briefly explained in this section.

- HA Area Team
- Regional Control Centre (RCC)
- Service Provider

The roles of other parties e.g. Police, Traffic Officer Service are explained in further detail in the HA document named Standard Incident Management Framework (SIMF)

3.1 Highways Agency (HA) Area Team

3.1.1 Role

The HA Area team's role in the Contingency Plan is to safeguard the Agency's interests at a area level. This may involve providing specialist advice to the RCC, Service Provider and other agencies involved in the incident. This may require the HA advising the Police on certain aspects regarding the network or any other Emergency Services involved in the Incident.

3.1.2 Responsibility

To authorise temporary variations for the Service Provider for items outside of their contract
To give Specialist advise to the RCC if requested

3.2 HA Regional Control Centre (RCC)

3.2.1 Role

The regional control centres are the centres for all communications regarding incidents on the Strategic network. They manage Traffic Officer involvement in incidents, liaise with the Emergency services and Service Providers, and manage HA's response to the incident at operational, tactical and strategic levels.

3.2.2 Responsibility

Specific responsibilities of the RCC include :

- Manage Traffic Officer involvement in incidents
- Co-ordinate the responses of emergency services and other service providers
- Monitor and manage traffic on the Strategic network
- Display messages on variable message signs (VMS)
- Take strategic control of the incident when required

3.3 The Service Provider

3.3.1 Role

The role of the Service Provider is to respond to incidents at an Operational (Bronze) command ,Tactical Management (Silver) and Strategic Command (Gold) when required on a 24/7 basis.

3.3.2 Responsibility

The responsibilities of the Service Provider are as follows:

- Provide and use the necessary operational expertise.
- Escalate incident management to a Tactical (Silver) level when required.
- Keep other parties informed of the situation.
- Trigger escalation of incident management to Strategic (Gold) level when required.
- Manage Service Provider operations and ensure that the right resources are provided
- Direct operational vehicles to incidents
- Provide a 24/7 response service to the RCC
- Provide other on road support requested by the Emergency Services or the Traffic Officers

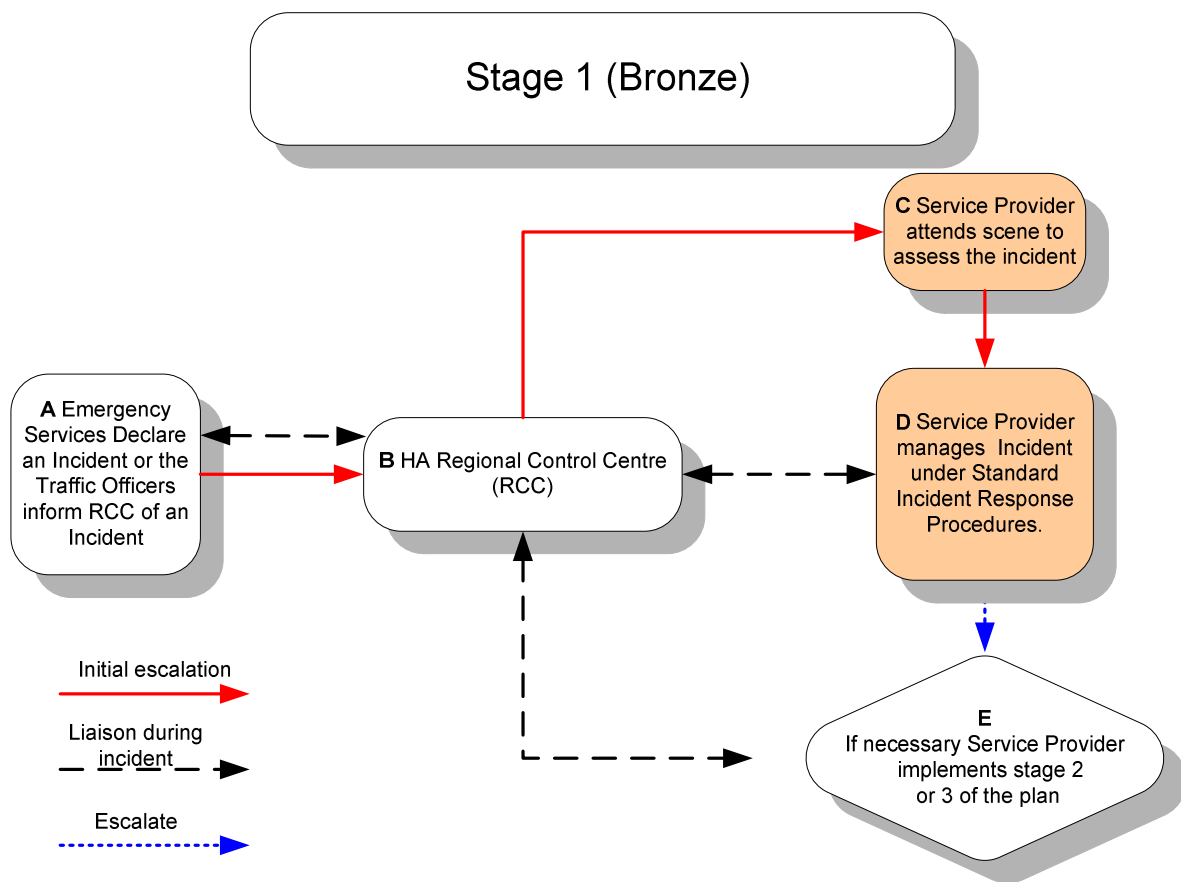
4.0 STAGE 1: SERVICE PROVIDER’S STANDARD INCIDENT RESPONSE (BRONZE)

4.1 Introduction

Most incidents that occur on the Highway Agency’s Strategic Network can be dealt with under the Service Provider’s established Standard Incident Response procedures.

These responses precede the implementation of the Contingency Plan as such. The Contingency Plan will be implemented when the Service Provider’s Standard Incident Response Procedures are unable to contain an incident or its effects, to the extent that the Incident Objectives set out in **Section 1.6** are threatened.

Figure 4.1: Service Provider’s Standard Incident Response Procedures



4.2 Box A

Police or Emergency services contact the RCC and inform them of an incident on the Strategic Network. A Traffic Officer contacts the RCC and informs them of an incident on the Strategic Network.

4.3 Box B

The RCC contacts the Service Provider and informs them that there is an incident on the network and assistance is required.

4.4 Box C

The Service Provider sends an Incident Support Unit (ISU) to attend the incident and make an initial assessment of the further response required.

4.5 Box D

The Service Provider sends the necessary resources to the scene of the incident and makes the necessary response (eg temporary signing, repairs to the infrastructure etc.). The Service Provider reassesses whether the incident can be managed under Standard Incident Response Procedures and whether any of the incident objectives are threatened.

4.6 Box E

If any of the incident objectives are threatened, the Service Provider will escalate the incident response to Stage 2 or 3. The escalation procedures are explained in **Section 5** (escalation to Stage 2) and **Section 6** (escalation to Stage 3).

4.7 Process Flow Charts

Include a process flowchart in Appendix F to explain Stage 1, showing the actions of each team or player and the lines of communication between them. The Service Provider column could be split in to separate columns for individual Service Provider teams. This will amplify Figure 4.1 and enable individuals to better understand the actions they have to take and who they need to communicate with. It may be helpful to cross refer to existing process flow charts describing Standard Incident Responses.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider. Introduce the flowchart here and highlight any points which Plan holders should have drawn to their attention.

5.0 STAGE 2: MOBILISATION OF THE SERVICE PROVIDER'S INFORMATION MANAGEMENT TEAM (IMT)

5.1 Introduction

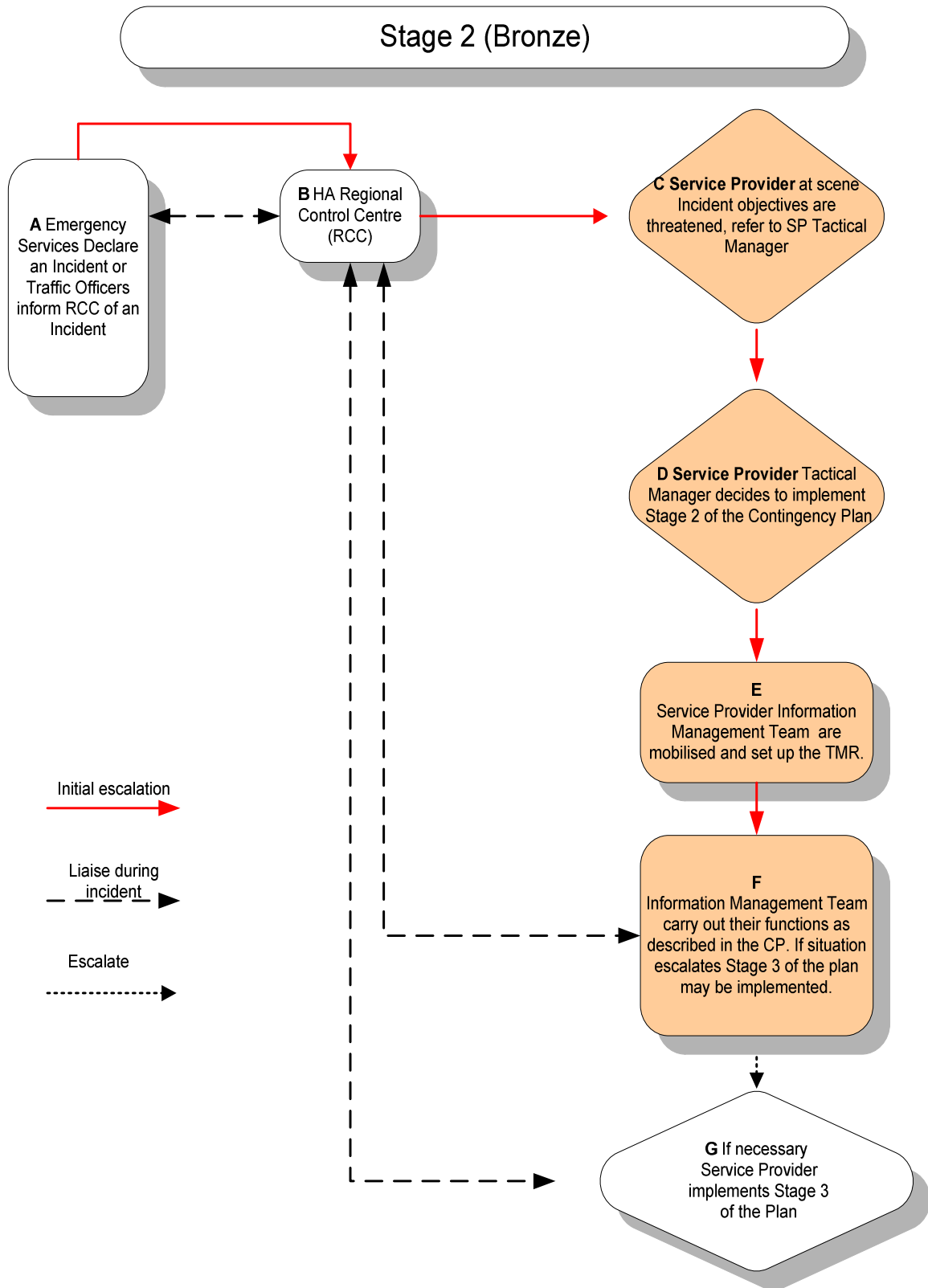
Mobilisation of the IMT (only) is needed where incident objectives are threatened but the operational response is straight forward and does not require tactical management. In these circumstances, the Plan would be “partially” implemented.

The IMT will attend the Tactical Management Room (TMR) and carry out the following duties:

- Liaise with the Service Provider staff on site
- Inform Major Stakeholders affected by the incident
- Inform Senior Management and regularly update
- Keep the RCC informed
- Monitor media broadcasts concerning the incident (TV, websites, radio)
- If media message is incorrect, inform the RCC

Figure 5.1 (on the following page) shows how Stage 2 is mobilised, key actions, and lines of liaison during the Stage. The key actions are explained in the succeeding sections.

Figure 5.1: Partial Mobilisation of the Service Providers Information Management Team



5.2 Box A

Police or Emergency services contact the RCC and inform them of an incident on the Strategic Network. A Traffic Officer contacts the RCC and informs them of an incident on the Strategic Network.

5.3 Box B

The RCC contacts the Service Provider's 24/7 control centre and informs them that there is an incident on the network and that the Traffic Officer or Emergency Services requires assistance.

5.4 Box C

Service Provider's staff at the scene update the Service Provider's 24/7 Control Centre of the events at the incident. If the Incident Objectives are threatened, the Tactical Manager is advised.

Explain:

- *How staff on site decide to contact the Tactical Manager*
- *who they contact*
- *How they contact the Tactical Manager*

5.5 Box D

The Service Provider's Tactical Manager assesses the situation and decides to implement stage 2 of the Plan.

Explain how the decision is then made to escalate to Stage 2, including:

- *how the need to escalate is identified*
- *who authorises the escalation*
- *what criteria influence the decision*

5.6 Box E

The Information Management team is mobilised, goes to the TMR and sets up operations.

Explain how this is done:

- *who is in the Information Management Team*
- *how they are mobilised*
- *how the Team sets up the Tactical Management Room (if not already fully functional)*

Details of the TMR are given in Section 6.

5.7 Box F

The Information Management Team carry out their functions in the TMR.

Explain how this is done:

- *how they decide which Stakeholders to contact*

- *how they obtain information re. the incident*
- *how they monitor media output*
- *how they make contact with RCC and stakeholders and maintain contact*
- *how they keep Service Provider Senior Management briefed (see Section 6)*
- *what information they have at their disposal in the Box of Reference(see section 15)*

5.8 Box G

If the situation deteriorates, the Information Management Team contacts the Tactical Manager and advises the situation.

Explain how this is done:

- *how a deteriorating situation is identified*
- *who the Information Management Team contacts*

The Tactical Manager then decides whether to escalate the Service Provider response to Stage 3, as described in Section 6.

5.9 Process Flow Charts

Include a detailed process flowchart in Appendix F to explain Stage 2, showing the actions of each team or player and the lines of communication between them. .The Service Provider column could be split in to separate columns for individual Service Provider teams. This will amplify Figure 5.1 and enable individuals to better understand the actions they have to take and who they need to communicate with.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider. Highlight any points which Plan holders should have drawn to their attention.

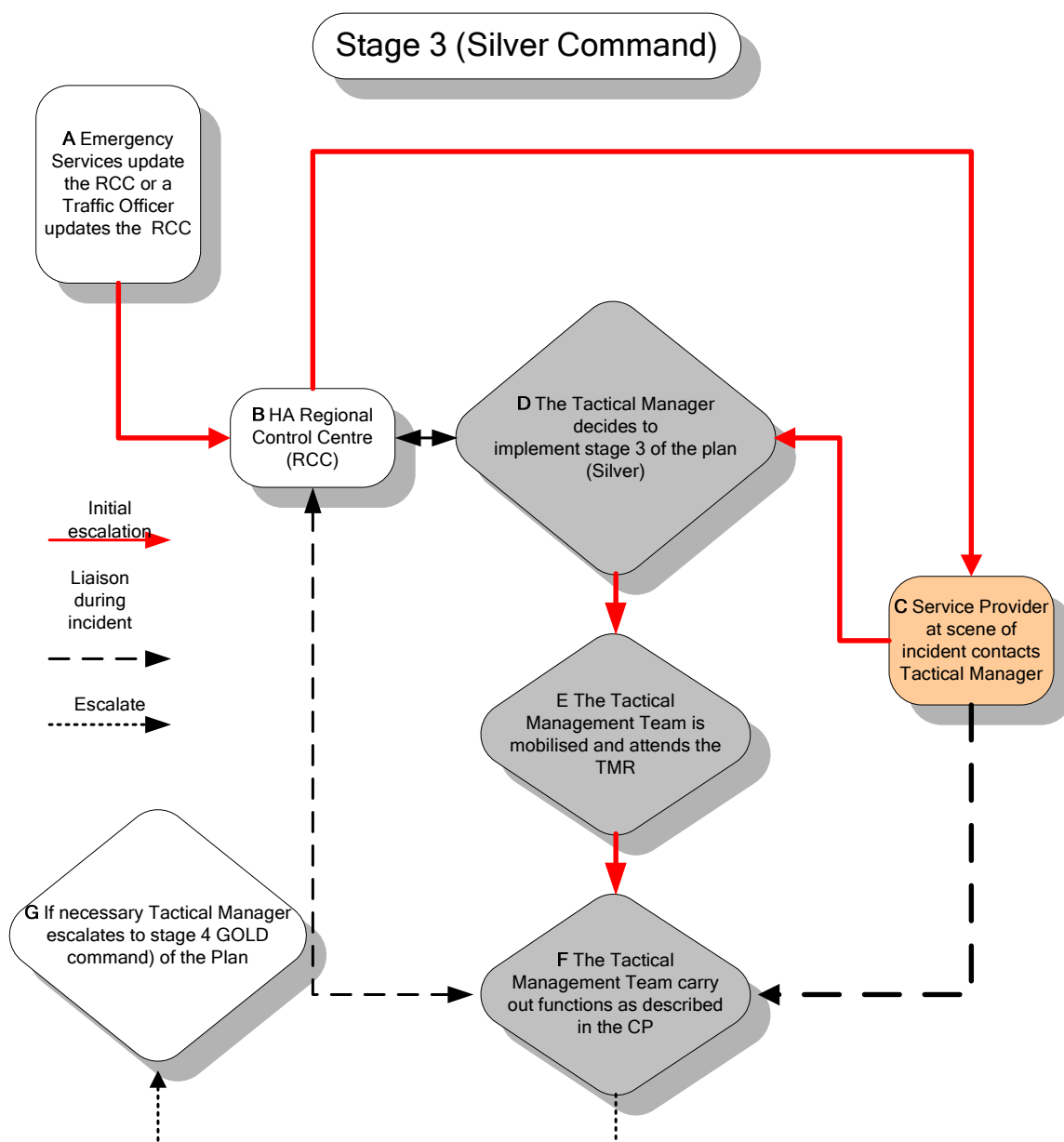
6.0 STAGE 3: SERVICE PROVIDER TACTICAL COMMAND (SILVER)

6.1 Introduction

Full mobilisation of the Service Provider's Tactical Management Team (TMT) in the Tactical Management Room (TMR) permits the Service Provider to provide tactical management of the situation remote from the incident(s) itself.

Figure 6.1 shows how Stage 3 is mobilised, key actions, and lines of liaison during the Stage. The key actions are explained in the succeeding sections.

Figure 6.1: Full Mobilisation of the Plan (Silver)



6.2 Escalation to Stage 3

Escalation from Stage 2 to Stage 3 is described in **Section 5**. This Section describes escalation directly from Stage 1 (Standard Incident Response procedures) to Stage 3.

6.2.1 Box A

Police or Emergency services contact the RCC and inform them of an incident on the Strategic Network. A Traffic Officer contacts the RCC and informs them of an incident on the Strategic Network.

6.2.2 Box B

The RCC contacts the Service Provider's 24/7 control centre and informs them that there is an incident on the network and that the Traffic Officer or Emergency Services requires assistance.

6.2.3 Box C

Service Provider's staff at the scene update the Service Provider's 24/7 Control Centre of the events at the incident. If the Incident Objectives are threatened, the Tactical Manager is advised.

Explain:

- *How staff on site decide to contact the Tactical Manager*
- *who they contact*
- *How they contact the Tactical Manager*

6.2.4 Box D

The Tactical Manager decides to escalate Service Provider response to Silver Command.

Explain how this is done:

- *who is authorised to approve the escalation*
- *what factors influence this decision*

6.2.5 Box E

The Tactical Manager mobilises the full TMT in the TMR. This team consists of personnel who have the experience and knowledge to tactically manage an incident on the network.

Their role is to give tactical advice to the teams on the ground and also to look at the whole network to assess the wider effects of the incident. In liaison with the Service Provider staff on site they make decisions on operational matters to minimise the impact of the incident.

Explain how this is done:

- *how the team is mobilised*
- *who is involved in the team*
- *how the TMR is mobilised*

6.3 Silver Command

6.3.1 Box A

Police or Emergency services regularly update the RCC with information regarding the incident. Traffic Officer regularly updates the RCC with information regarding the incident.

6.3.2 Box B

The RCC is informed that the Service Provider has mobilised its TMT and then liaises with the TMT.

6.3.3 Box C

The Service Provider at the scene of the incident regularly updates the Tactical Manager.

6.3.4 Box D

The TMT manages the incident at a tactical level in liaison with the RCC. Further details of the TMT and the TMR are given below.

6.3.5 Box G

The Tactical Manager will continually monitor the situation and if necessary, will escalate the response to Gold Command.

Explain how this is done:

- *What factors influence this decision*
- *Who the Tactical Manager contacts*
- *Who is authorised to approve the escalation*
- *What are the functions of the TMT in this scenario*

6.4 Tactical Management Team (TMT) and Tactical Management Room (TMR)

Tactical Management of an incident by the Service Provider is core to the successful implementation of the Plan. Further explanation of the TMT and TMR are given below.

6.5 Tactical Management Team (TMT)

6.5.1 TMT Key Functions

The key functions of the TMT are to:

- Relieve the Service Provider's 24/7 Control Centre of the burden of having to deal with a Major Incident while continuing to fulfil all its other functions.
- Insert a tactical planning capability into incident response, to take full account of network wide events, events in neighbouring Areas, and incoming HA and Government advice or instructions
- Be a forum within which tactical decisions can be made, in conjunction with the Emergency Services, local authorities, RCC, HA Area teams and Government as necessary
- Enable complex situations to be managed in such a way that the Incident Objectives are achieved, when they might otherwise be threatened

-
- Be proactive in safeguarding the comfort and wellbeing of drivers trapped in stationary vehicles on the network, including liaising with the Police/RCC over procurement of local authority support services
 - Be a centre for “enhanced” communications with HA and network stakeholders, (i.e. above the level of communication required in established Incident Response Procedures and suited to a serious situation which may be of significant media interest or political concern)
 - Liaise with RCC
 - Formulate a recovery plan, close the incident down, and pass control of the site back to the Service Provider’s 24/7 Control Room.
 - Send a representative to Police Silver control if requested to act as a Tactical Adviser.

6.5.2 TMT Key Characteristics

The TMT will be **aware, in control, proactive and tactical**.

Key characteristics of the team will be:

- Up-to-date knowledge of the state of the whole network and incident, at all times
- Proactive management of the situation, to achieve the Incident Objectives
- Proactive communication of information, to those who need to know
- Tactical thinking and tactical decision making, but tactics which are capable of timely implementation within available resources
- Proactive outreach to other organisations, when their assistance is required.

6.6 TMT Structure

The Tactical Management Team comprises a number of sub-teams:

- Tactical Decision Team
- Information Management Team
- Administration Team
- Senior Management Team

Members of staff available to form each team are listed in Appendix B, together with their contact details.

In addition, Appendix B.5 lists other resources who may be called upon by the TMT (eg technical specialists).

Specify the minimum numbers of staff from each team to be included in the TMT.

The functions of each team are explained below.

6.6.1 TMT - Tactical Decision Team

This team is formed of staff who are responsible for the day to day running of the network. They have sound experience and knowledge of the network and current Standard Incident Response procedures. All members of the team are qualified to approve escalation to Stage 3, and then to act as the Tactical Manager in the TMR.

6.6.2 TMT - Information Management Team

The functions of the Information Management team in a partial mobilisation are set out in Section 5. In a full mobilisation, they will be assisted by Admin staff with communicating with HA and local authorities on operational matters as required. The Information Management Team will be composed of individuals qualified to undertake these functions.

6.6.3 TMT - Administration Team

The Admin Team will :

- ensure that communications, decisions and actions by all staff are recorded
- use the HA website to view VMS settings on the network
- monitor traffic congestion from websites and other sources.
- keep incident overview board up to date
- advise the Tactical Decision Team members of other events on the network (eg roadworks).
- provide admin support to all other members of the TMT including attending to the smooth running of IT and other facilities in the TMR.

6.6.4 TMT - Senior Management Team

A nominated Senior Manager will be kept informed of the situation at all times so that they will be in a position to respond to queries from Board level within the HA or from Central Government. They may choose to be located within the TMR, or they may arrange to remain in contact elsewhere. If the Tactical Management Team are required to give advice or authorisation for Service Provider activities that are out of their jurisdiction then they would escalate the incident to Gold Command. This would require the Senior Management being briefed to take appropriate action.

6.7 TMT - Organisation

Explain

- *how the TMT is structured*
- *lines of communication within the TMT*
- *external lines of communication*
- *how is it ensured that there will be sufficient staff available in each sub-team to mobilise the whole TMT at all times*

6.8 Tactical Management Room (TMR)

The TMT will operate in the Tactical Management Room. This room contains the equipment and resources needed to support the TMT.

6.8.1 TMR - Location

Explain where the TMR is located and how it is accessed.

6.8.2 TMR - Facilities

The TMR offers the following facilities:
computers
phone lines

Magnetic display board

Printer

Box of Reference

Digital radio etc.

The list of equipment is whatever the Tactical Management Team (TMT) deem necessary to manage an incident, and should be modified accordingly.

6.8.3 TMR - Setup

If the TMR is not permanently set up for use by the TMT, this section should explain how the TMR is to be set up and equipment activated for use by the Information Management team (partial implementation) or the TMT (full implementation) when the Plan is mobilised.

If there is IT equipment to be used in the TMR then provision should be made for replacement of missing or defective equipment in order to ensure continuity of full operation. Support staff available on a 24/7 basis or, as a minimum, a box of IT spares should be considered.

6.9 Interface with other Service Provider Tactical Teams

This section should explain how the TMT interfaces with other Service Provider tactical teams that may be active at the same time e.g. TMT for Emergency Operational Plans, Winter Maintenance or Special Events.

6.10 Emergency Service Interfaces

Communication between the Area Team and the controlling Emergency Service will be:

LEVEL OF CONTROL	Emergency Service	Service Provider Team
Bronze	Officer in Charge on site	Service Provider staff on site
Silver (communication via RCC)	*Incident Control Room	Service Provider Tactical Management Team
Silver – Strategic (communication via RCC)	Gold Control (if established) or Incident control room	Service Provider Gold Command
* the Incident Control Room may or may not be on site.		

6.11 Service Provider Offices and Depots

Details are given in Appendix B.6

6.12 Process Flow Charts

Include a detailed process flowchart in Appendix F to explain Stage 3, showing the actions of each team or player and the lines of communication between them. The Service Provider column could be split in to separate columns for individual Service Provider teams. This will amplify Figure 6.1 and enable individuals to better understand the actions they have to take and who they need to communicate with.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider.

Highlight any points which Plan holders should have drawn to their attention.

7.0 STAGE 4: SERVICE PROVIDER GOLD COMMAND

7.1 Introduction

The Service Provider will escalate the plan to Gold level if the incident objectives are still threatened and the situation cannot be managed at a tactical level of command.

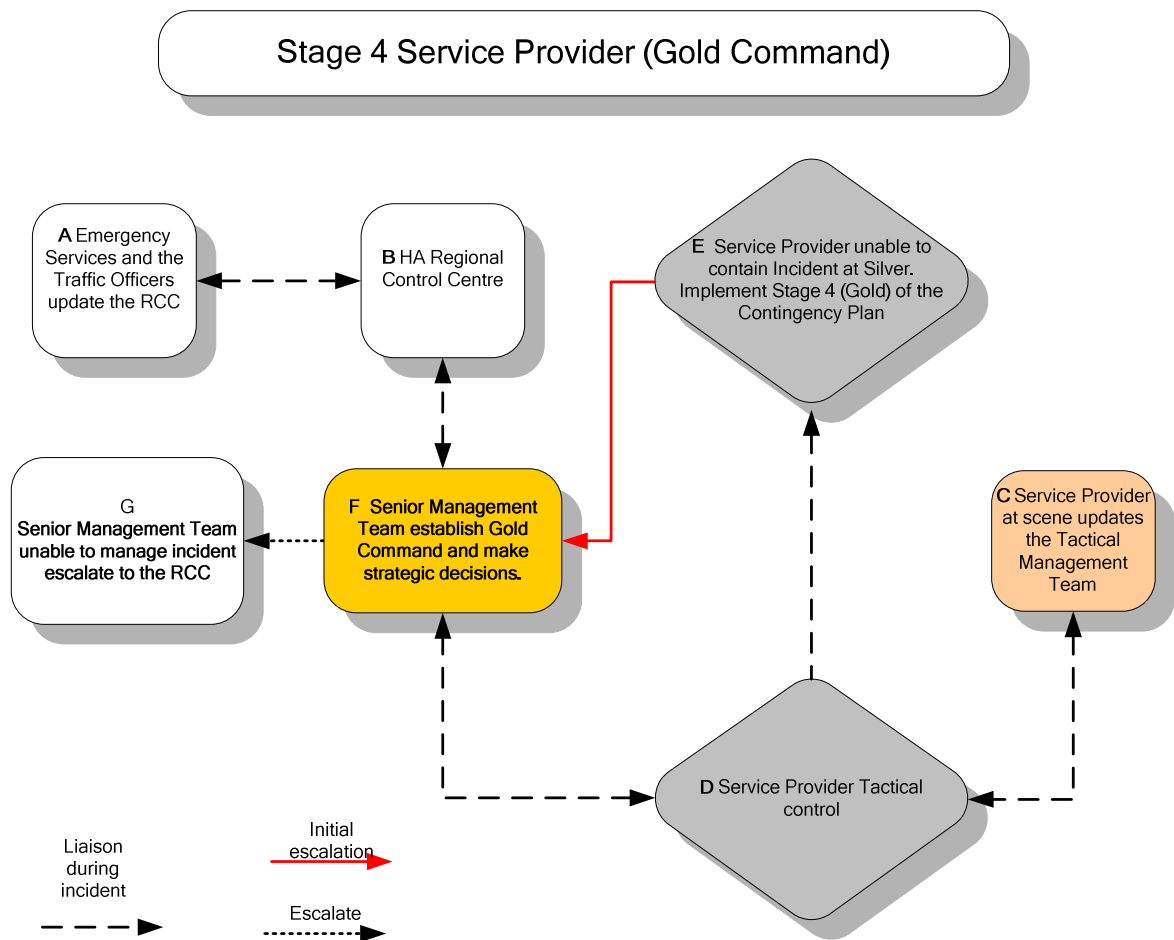
For example, this might arise if:

- the need to re-allocate resources within the Service Provider's own organisation beyond the powers of the TMT
- the need to request mutual aid from other adjacent areas.

Strategic decisions and control of the incident are passed to the Service Providers Senior Management Team. The Senior Management Team will then make the Strategic decisions concerning the incident whilst keeping the RCC informed of the situation.

Figure 7.1 (on the following page) shows how Stage 4 is mobilised, key actions, and lines of liaison during the Stage. The key actions are explained in the succeeding sections.

Figure 7.1: Service Provider Gold Command



7.1.1 Box A

Police or Emergency services regularly update the RCC with information regarding the incident. Traffic Officer regularly updates the RCC with information regarding the incident.

7.1.2 Box B

The RCC is informed that the Service Provider has mobilised its TMT and then liaises with the TMT.

7.1.3 Box C

The Service Provider at the scene of the incident regularly updates the Tactical Manager.

7.1.4 Box D

The TMT manages the incident at a tactical level in liaison with the RCC. Further details of the TMT and the TMR are given below.

7.1.5 Box E

The TMT unable to contain the incident at Silver command and therefore escalates the incident to the Senior Management Team to set up Gold Command.

7.1.6 Box F

Senior Management Team establishes Gold Command and makes strategic decisions.

7.1.7 Box G

Senior Management Team unable to contain incident and therefore escalates the incident to the RCC for them to manage.

7.1.8 Process Flow Charts

Include a detailed process flowchart in Appendix F to explain Stage 4, showing the actions of each team or player and the lines of communication between them. The Service Provider column could be split in to separate columns for individual Service Provider teams. This will amplify Figure 7.1 and enable individuals to better understand the actions they have to take and who they need to communicate with.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider. Highlight any points which Plan holders should have drawn to their attention.

8.0 STAGE 5: HA REGIONAL CONTROL CENTRE STRATEGIC COMMAND (SILVER)

8.1 Introduction

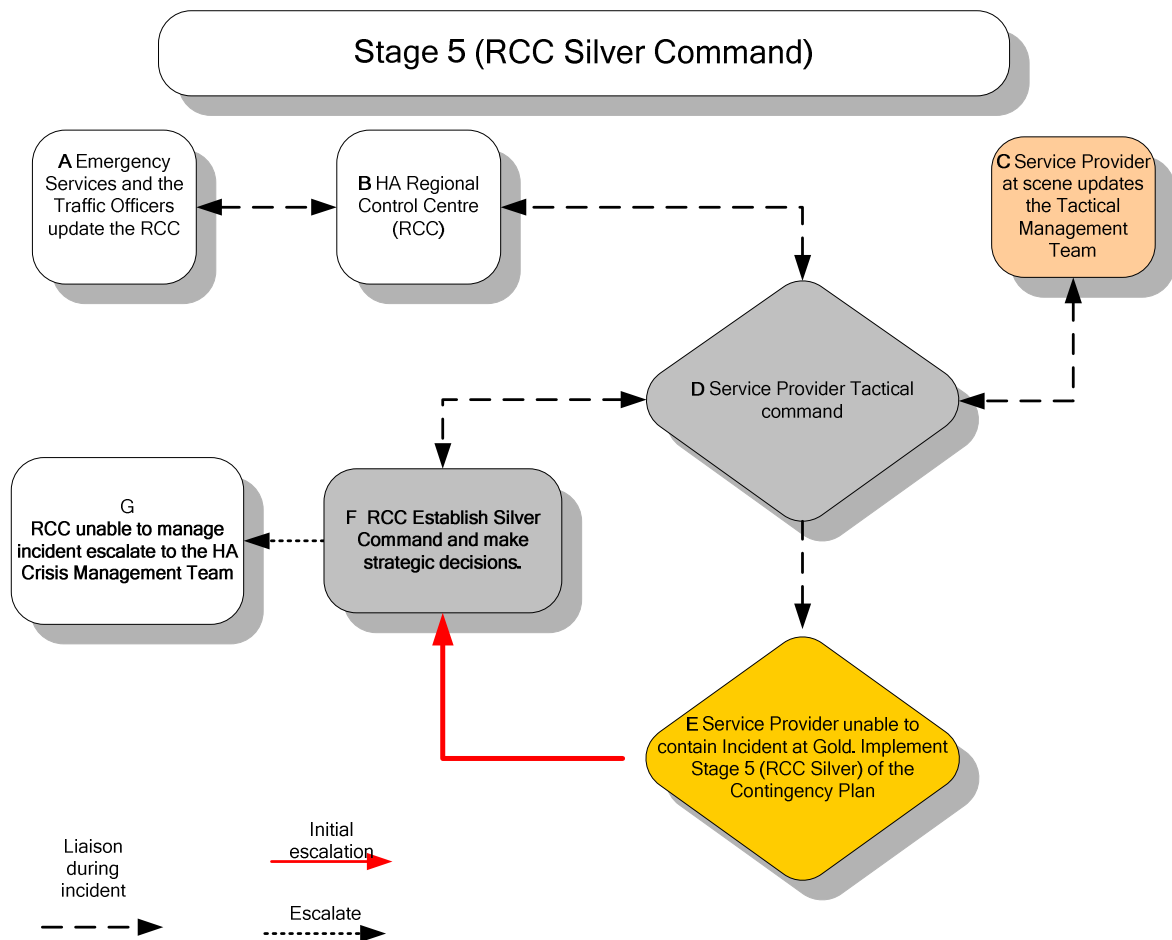
The Service Provider will escalate the plan to RCC (Silver level for them) if the incident objectives are still threatened and the situation cannot be contained at an Area level. For example, this might arise if:

- the Area does not have adequate resources and is unable to obtain them from Adjacent Service Providers
- disruption in the Area is threatening adjacent Areas
- regional wellbeing is threatened

Strategic decisions and control of the incident are passed to the RCC. The RCC will then make the Strategic decisions concerning the incident whilst keeping the relevant HA APM informed of the situation.

Figure 8.1 (on the following page) shows how Stage 5 is mobilised, key actions, and lines of liaison during the Stage. The key actions are explained in the succeeding sections.

Figure 8.1: Escalation to HA Regional Control Centre (RCC)



8.2 Escalation to RCC

8.2.1 Box E

Explain how this escalation takes place:

- *how the need for escalation is identified*
- *who the Service Provider contacts*
- *who authorises escalation*
- *what factors influence this decision*

8.3 RCC Silver Command

8.3.1 Box A

Emergency services contact the RCC and update them on the progress of the incident. Traffic Officer updates the RCC of the progress of the incident.

8.3.2 Box B

The RCC receives up to date information from Emergency Services and the Service Provider concerning the incident.

8.3.3 Box C

The Service Provider at the scene updates the TMT with information concerning the incident.

8.3.4 Box D

The TMT functions as in Stage 3, except that strategic decisions are made by Service Provider Senior Management Team Gold Command. The TMT will provide tactical advice to Gold Command as requested, and will make tactical decisions within the strategic framework defined by Gold Command.

8.3.5 Box E

The Service Providers Senior Management Team takes Strategic command of the incident. If they are unable to manage the incident they escalate to the RCC.

8.3.6 Box F

The RCC set up Silver Command to take strategic command of this incident.

8.3.7 Box G

If the RCC are unable to contain the incident at a Regional level they may decide to escalate command upwards to the National Crisis Management Team. This procedure is described in RCC Contingency Plan and the National Crisis Management Plan.

8.4 Process Flow Charts

Include a detailed process flowchart in Appendix F to explain Service Provider actions during Stage 4, showing the actions of each team or player and the lines of communication between them. This will amplify Figure 8.1 and enable individuals to better understand the actions they have to take and who they need to communicate with. Detailed actions for the HA APM and the RCC need not be shown, except for interfaces with the Service Provider team.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider. Highlight any points which Plan holders should have drawn to their attention.

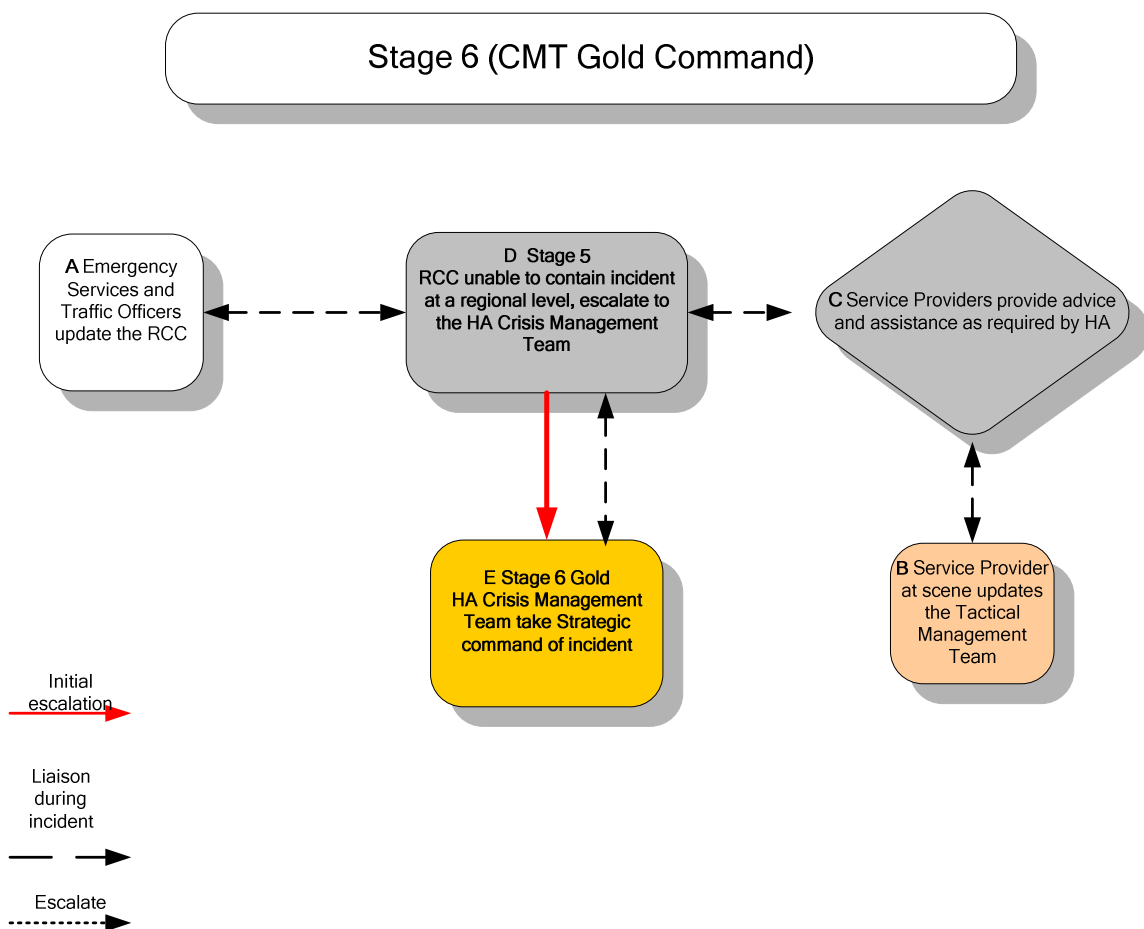
9.0 STAGE 6: HA CRISIS MANAGEMENT TEAM STRATEGIC COMMAND (GOLD)

9.1 Introduction

If the RCC is unable to contain the incident at a Regional level, then they will escalate the incident up to the HA Crisis Management Team (CMT). The HA Crisis Management Team will then make the Strategic decisions concerning the incident.

Figure 8.1 shows how Stage 6 is mobilised, key actions, and lines of liaison during the Stage. The key actions are explained in the succeeding sections.

Figure 9.1: HA Crisis Management Team



9.2 Escalation to HA Crisis Management Team

9.2.1 Box D

RCC decides that the incident or its effects cannot be contained at an Area or regional level and is of national significance. Strategic control of the incident is passed up to HA's National Crisis Management Team.

9.3 Gold Control

9.3.1 Box A

Police and Emergency services contact the RCC and update them on the progress of the incident. Traffic Officer updates the RCC of the progress of the incident.

9.3.2 Box B

The Service Provider's team at the scene update the Service Provider's Tactical Management Team of progress at the incident.

9.3.3 Box C

The Service Providers provide advice and assistance to the RCC, and provide tactical management of the incident within the strategic framework set by the Highways Agency.

9.3.4 Box D

The RCC liaises with the national Crisis Management Team and receive strategic direction. They interpret this strategic direction at a regional or Area level, and provide strategic instruction to the Service Providers.

9.3.5 Box E

HA's national Crisis Management Team takes strategic control of the incident (refer to National Crisis Management Plan).

9.4 Process Flow Charts

Include a detailed process flowchart in Appendix F to explain Service Provider actions during Stage 5, showing the actions of each team or player and the lines of communication between them. This will amplify Figure 9.1 and enable individuals to better understand the actions they have to take and who they need to communicate with. Detailed actions for the Crisis Management team will not be shown.

Detailed actions for the HA APM and the RCC need not be shown, except for interfaces with the Service Provider team.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider. Highlight any points which Plan holders should have drawn to their attention.

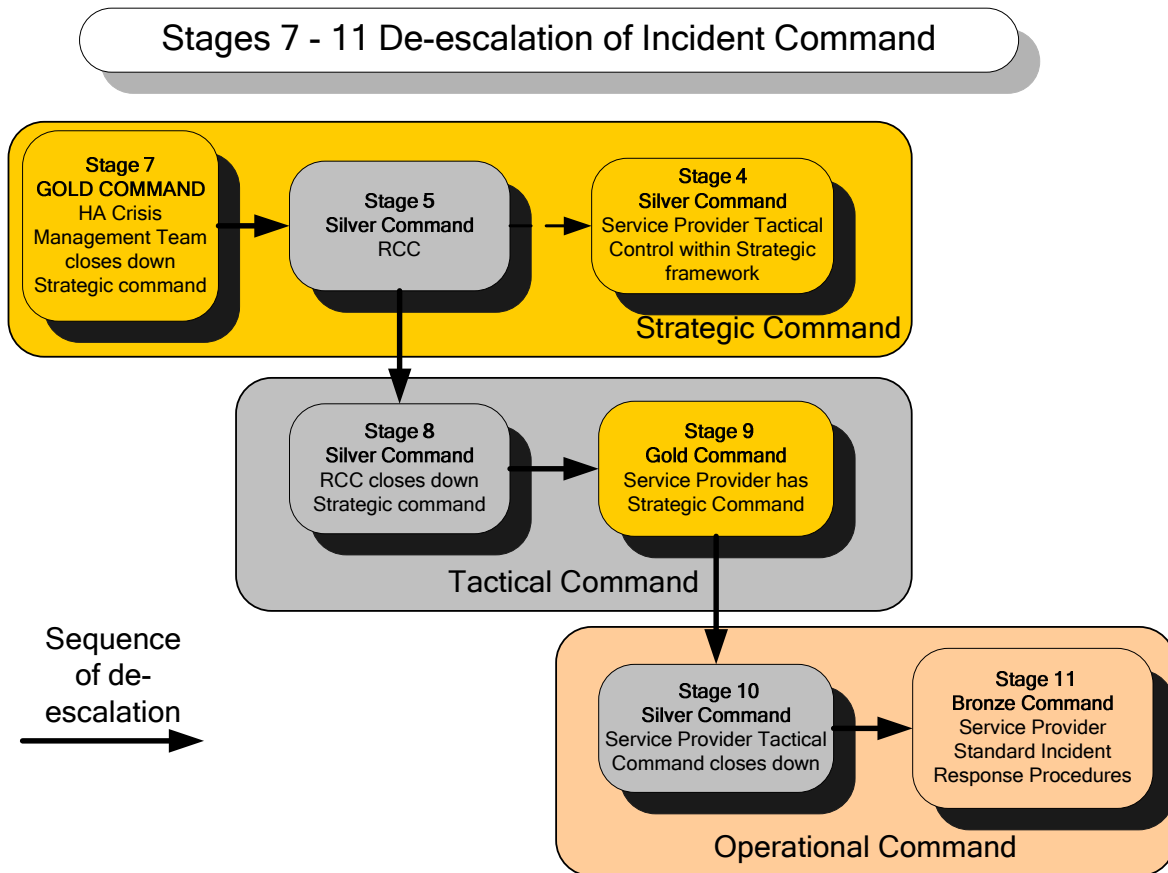
10.0 STAGES 7 - 11: DE-ESCALATION OF INCIDENT CONTROL

10.1 Introduction

As the threat from the incident recedes, command is successively passed back down from the HA Crisis Management team to the RCC, Service Provider Gold Command and finally to Service Provider Bronze command.

Figure 10.1 shows how Stages 7 to 11 are initiated, key actions, and lines of liaison during these Stages. Each stage is explained in the succeeding sections.

Figure 10.1: De-escalation of Incident



10.2 Stage 7: CMT close down Command of Incident

HA Crisis Management Team decides that the situation no longer needs strategic command at a national level, and passes strategic command to the RCC.

The RCC manage the incident as per **stage 5** in this plan and follow procedures set out in the RCC Contingency Plan and the HA SIMF document.

The service provider will still be operating at Gold (Strategic Command) during the RCC strategic command of the incident.

10.3 Stage 8: RCC closes down Command of Incident

RCC decides that the incident no longer requires strategic command and passes command to the Service Provider. This is a reversion to **Stage 4** of the Plan, and the actions for that Stage are repeated.

10.4 Stage 9: Service Provider closes down Strategic Command of incident

The Service Provider decides that the incident no longer requires Strategic Command and command of the incident reverts to the Service Providers Tactical Command This is a reversion to Stage 3 of this plan.

10.5 Stage 10: Service Provider Command of Incident

The Service Provider decides that the incident no longer requires Tactical Command and command of the incident reverts to the Service Providers Standard Incident Response Procedures. This is a reversion to Stage 1 of this plan.

10.6 Stage 11: Service Providers Commands incident using Standard Incident Response Procedures

The Service Provider manages the incident using its Standard Incident Response Procedures as per Stage 1 of this plan.

10.7 Process Flowcharts

Include a detailed process flowchart in Appendix F to explain Service Provider actions during Stages 7 to 11, showing the actions of each team or player and the lines of communication between them. This will amplify Figure 10.1 and enable individuals to better understand the actions they have to take and who they need to communicate with. Detailed actions for the HA APM and the RCC need not be shown, except for interfaces with the Service Provider team.

An example of an appropriate style of process flowchart is shown in Appendix F of this Model Document, but this should be modified and expanded to suit the needs of each Service Provider. Highlight any points which Plan holders should have drawn to their attention.

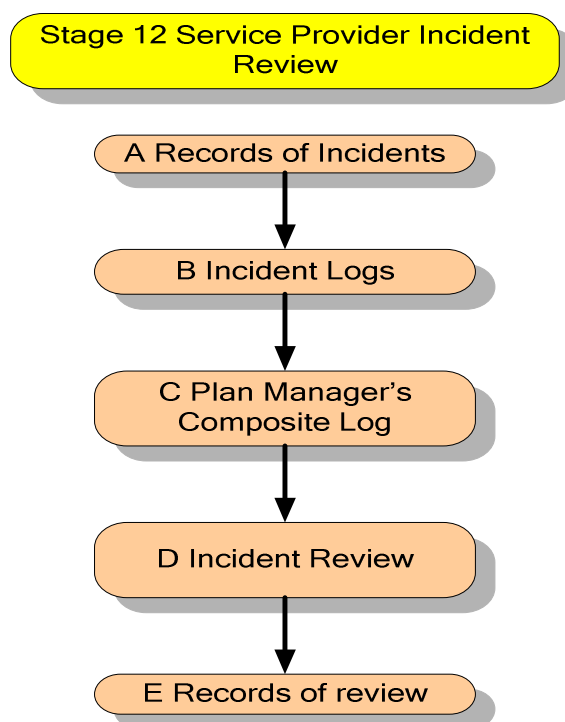
11.0 STAGE 12: SERVICE PROVIDER INCIDENT REVIEW

11.1 Introduction

The Plan format and content need to be reviewed after an incident requiring any stages of the Plan (above Stage 1) to be mobilised. The Service Providers incident review should be in line with guidance from the HA AMM 70/06 which offers guidance on Post Incident Cold Debrief Process. The following is a walk through agenda that the Service Provider should use as a guide.

Figure 11.1 shows the review process needed to achieve this.

Figure 11.1: Service Provider Incident Review



11.2 Box A

When a partial or full Contingency Plan has been implemented, records must be kept of:

- Communications
- Actions
- Decisions

Throughout, incident records must be kept as described in this section of the plan. These should be recorded in the manner most convenient for each person involved (e.g. on purpose-prepared forms, in a diary or notebook, on a Dictaphone or on a computer etc).

11.2.1 Records of Communications

All communications involving the relay of information and decision making must be recorded. Records of Communication must be made by both parties involved and must include:

- Date and time
- Person initiating communication
- Person receiving communication
- Summary of information passed
- Summary of response (if any)
- Next actions (if any) as a result of the communication
- Who will take these actions (if any)

If decision making is involved, the following additional information must be recorded:

- Decision to be made
- Options considered
- Decision made
- Reasons for decision made

Please note that it is vital to record decision making processes to permit a full review of the handling of the incident afterwards.

11.2.2 Records of Actions

Records of key actions must be kept to include:

- Location of incident
- Name of person taking action
- Date and time
- Action taken
- Outcomes

11.2.3 Records of Decisions

Unless recorded within a Record of Communication, all key decisions must be recorded to include:

- Location of incident
- Name of person(s) making decision
- Date and Time
- Nature of decision to be made
- Options considered
- Decision made
- Reasons for decision

11.3 Box B

Incident logs are summaries of the Records above, and must be completed by:

For the purposes of the Service Provider Incident Review, list the people, teams or organisations who should prepare Incident Logs.

Each log should contain the following information:

- Times and dates of specific communications, actions or decisions made

- Information relayed
- Actions taken
- Decisions made

11.4 Box C

The Service Provider's Plan Manager will then combine all logs and:

- Seek clarification of inconsistencies between individual logs
- Seek any missing information
- Produce a composite log of the whole incident covering all actions.

11.5 Box D

The Service Provider will arrange an internal Incident Review adopting the following procedure. Review of incident by key staff involved from:

- List the organisations that should be represented at the review.

The review should include:

- Actions taken and assessment of their appropriateness
- Actions not taken and assessment of whether they were not needed or whether they should have been taken
- Communication links that were implemented and assessment of whether they worked efficiently
- Communication links that were not established and assessment of whether they were not needed or whether they should have been made
- The timing of actions, including establishment of communications links
- Liaisons with third parties, particularly the emergency services, Service Providers and Local Authorities
- Whether the right parties were involved in dealing with the incident
- The mobilisation of key staff
- Stakeholder communications, with particular regard to the parties contacted and the usefulness (to them) of the information received
- The usefulness and accuracy of information contained within the Plan and the need for any additional information (or less information).
- Overall, the structure and function of the Service Provider response (would an altogether different approach have been more effective?)
-

All persons involved in the incident must submit their logs to the Plan Manager within 2 working days of the incident. The Plan Manager is then to produce a composite log and an Incident Review within ten working days of the incident.

11.6 Box E

Where an operational review is undertaken, copies of the minutes of the meeting and other relevant papers will be provided to the HA Area Performance Team.

It should be emphasised that the review has the sole aim of strengthening the Service Provider response or confirming that existing response procedures are appropriate. It is not concerned with allocating blame to any individual or organisation.

Should legal proceedings be pending as a result of the incident, the circumstances under which the Incident review takes place will be subject to a further review to ensure that individuals are not compromised in anyway.

It should be noted that any notes taken or documents produced as a result of any review may become subject to relevant disclosure rules at a subsequent legal hearings, whether criminal or otherwise. In particular if there is suspicion of any professional negligence being evident in such a review, advice should be sought.

12.0 STAGE 13: LESSONS LEARNED

12.1 Future Plans

Revisions of future Plans should incorporate points arising from the Incident review with the aim of ensuring a more effective response by the Service Provider when the next incident occurs.

If immediately after an incident it is the view of the Service Provider that significant improvements can be made to HA/other operational procedures, then immediate feedback should be given to the HA so that they can share this with other Areas.

12.2 Personal Incident Debriefing

If any member of the Staff from the HA or the Service Provider requires a personal incident debriefing for stress or trauma reasons, then they should contact their line manager or confidential counselling services supplied by their employers.

13.0 TACTICAL DIVERSION ROUTE DOCUMENT (DRD)

13.1 Purpose and functions of Tactical Diversion Routes

Diversion routes off HA's strategic network on Local Highway Authorities (LHA) roads are required for tactical diversion to assist incident management. These routes are shown in the DRD.

13.2 Contents of the Diversion Route Document

Explain the contents of the DRD and how this information is to be used – use AMM 71/06 as a guide.

13.3 Classification of Diversion routes

Diversion routes are subject to a formal HA classification (defined in AMM 71/06) to indicate their status in terms of whether they have been approved by Police, Local Authorities etc. These classifications are shown in the DRD.

13.4 2-way Traffic Diversion

If a link in the Service Provider's Area Network is closed in both directions then the relevant Police Force or Traffic Officer will decide if the approved diversion route is capable of accommodating traffic in both directions. If it is not, the Police or Traffic Officer may request (via the RCC) another diversion route from the TMT.

14.0 BOX OF REFERENCE

14.1 Introduction

The Box of Reference contains comprehensive information about the network for use during Tactical and Strategic control of incidents.

There are three Boxes:

- one stored in the Tactical Management Room (TMR)
- one stored at the RCC
- one held by the Service Provider's Contingency Plan Manager.

The box contains a list of contents and instructions as to when these have to be checked and updated. The Service Provider Contingency Plan Manager will check and update all contents on a regular basis in accordance with the instructions.

14.2 Information in Box

The types of information stored in the Box of Reference are summarised below. There are four types of documents stored in the box of reference:

- Diversion Route Document (DRD)
- Major Stakeholder Emergency Plans
- Service Provider Operational Plans
- Reference Information Document (RID)
-

These are explained in more detail below.

14.3 Diversion Route Document (DRD)

Tactical Diversion Routes for the Strategic Network (DRD)

Details of the DRD are given in section 14.

14.4 Major Stakeholder Emergency Plans

Copies of Major Stakeholder Emergency Plans within the Service Providers area should be stored in the Box of Reference. Contact with all Major Stakeholders should be made annually to obtain updated versions of these plans.

List here the Major Stakeholder Emergency Plans stored in the Reference Box.

14.5 Service Provider Operational Plans

Service Provider operational plans should be stored in the box of reference. These may be required by the TMT if they are to be implemented at the same time as the Contingency Plan..

List here the Service Provider Operational Plans included in the Reference Box.

14.6 Reference Information Document

The Reference Information Document stores information that may be required by the TMT when dealing with an incident. This document should store all information required by the TMT that is not otherwise easily accessible. If the information is easily accessible, then a file path name or web

address can be given for quick reference. Types of information that could be stored in this document are listed below.

Under each of the following headings, explain what information is contained in the RID and how it is referenced therein, or indicate how it can otherwise be accessed..

14.6.1 Schematic Diagrams and Key location features of the Network

These are diagrams showing the junctions, bridges, marker posts and all the key features on the HA Network. These can be used for quick reference to check the layout of the Network at a given location.

14.6.2 Emergency Crossover Points

These may be used in Emergencies to enable the Traffic Officers or Police to turn traffic around.

14.6.3 Vulnerable Nodes

These are strategic structures or junctions which if taken out of use by a terrorist act or a major incident will cause major disruption to the network.

14.6.4 Emergency Access Points on Network

These are access points which the Emergency Services can use to gain access to the HA Network

14.6.5 Area Depot Locations

Maps and contact details of all the Service Providers depots on the Area

14.6.6 Stakeholder Contact Details

Contact names, addresses, telephone and e-mail addresses of all Major Stakeholders who may be affected by an incident on the HA network.

14.6.7 Sign Bin Inventory

Maps and lists of contents of all the sign bins on the HA network

14.6.8 Location of CCTV Cameras

A map showing the locations of the cameras and details of who operates the CCTV on the Service Providers network.

14.6.9 Business Continuity

Service Provider's Business Continuity Plan

14.6.10 Network Lighting

A map showing locations and types of Lighting on the HA Network

14.6.11 Location of Traffic Signals

A map showing locations and contact details of who operates the traffic signals on the HA Network

14.6.12 VMS Locations

A map showing locations and types of VMS on the HA Area Network

14.6.13 Major Works

Locations, dates and contact details of major works on the HA Network

14.6.14 External Events

Locations, dates and contact details of External Events impacting on the HA Network

14.6.15 Police Boundaries

A map showing locations and details of Police Boundaries on the HA Network

14.6.16 Emergency Services

Contact details of all relevant Emergency Services in the HA Area Network

14.6.17 Traffic Officer Boundaries

A map showing locations and details of Traffic Officer Boundaries on the HA Area Network

14.6.18 High Risk Weather sites

A map showing locations of all high risk weather sites on the HA Area Network

14.6.19 Hazardous sites adjacent to the Strategic Network

A map showing locations of all hazardous sites adjacent to the HA Area Network that would cause major disruption to the network.

14.6.20 Network Rail Bridges over the strategic network

A map or table showing locations of all Network Rail Bridges that run over or under the HA Area Network

14.6.21 Welfare

Contact details for welfare assistance if required by the Service Provider or HA Personnel

14.6.22 Financial Implications (Green Claims)

Contact details and procedures for financial claims involving incidents on the network.

14.6.23 Plant and Equipment

Types of Plant and equipment that may be required during of after an incident on the network and also contact details if required.

14.6.24 Specialist Contractors

Contact details and locations of specialist contractors that may be required to attend the scene of an incident.

14.6.25 Communication Systems

The types of communication systems used by the service provider should be explained in this section.

14.6.26 Liaison with Adjacent Areas

This section should contain contact information regarding details and procedures on how to contact and work with adjacent Areas.

15.0 PLAN MANAGEMENT

15.1 Plan Manager

Give details of the Plan Manager, including contact details

15.2 Plan Holders and Distribution

The plan should be distributed to all personnel who are involved in any procedure or process within the Contingency Plan. Include a list of plan holders in Appendix A. This list should include Traffic Officers, RCC's, Major Stakeholders such as the Local Authorities, Police Forces, Adjacent Service Providers and the HA Area teams.

All plan holders are listed in Appendix A of this document. Appendix A shows how the plan is to be distributed to each plan holder in the form of a

**Hard Copy
CD Copy**

15.3 Plan Updates

The plan is a live document that is to be updated quarterly. The Plan will be subject to a continuous flow of new information received. This information has to be managed and a document called the "Management of Area Service Provider Contingency Plans" has been produced to assist the Plan Manager with the task of updating the Contingency plan and associated documents.

APPENDIX A PLAN HOLDERS

Below is an example of a heading for a list of Plan holders. The Plan holders should be individuals within such agencies that are involved in the incident or may be affected by the impact of the incident.

If further contact details are given elsewhere in another context e.g. in another Appendix or in the Box of Reference, please insert details in this table.

Further contact details in:	Copy Number	Name	Organisation	Position	E-mail address	CD/ Hard copy

APPENDIX B CONTACT DETAILS

B1 Tactical Decision Team

Name	Position	Contact information
Tactical Decision Team		
Person 1		Work: Fax: Mobile: Home: Email:
Person 2		Work: Fax: Mobile: Home Email:
Person 3		Work: Fax: Mobile: Home: Email:
Person etc		Work: Fax: Mobile: Home: Email:

B2 Senior Management Team

Name	Position	Contact information
Senior Management Team		
Person 1		Work: Fax: Mobile: Home: Email:
Person 2		Work: Fax: Mobile: Home Email:

Name	Position	Contact information
Senior Management Team		
Person 3		Work: Fax: Mobile: Home: Email:
Person etc		Work: Fax: Mobile: Home: Email:

B3 Information Management team

Name	Position	Contact information
Communication Team		
Person 1		Work: Fax: Mobile: Home: Email:
Person 2		Work: Fax: Mobile: Home: Email:
Person 3		Work: Fax: Mobile: Home: Email:
Person etc		Work: Fax: Mobile: Home: Email:

B4 Administration Team

Name	Position	Contact information
Administration Team		
Person 1		Work: Fax: Mobile: Home: Email:
Person 2		Work: Fax: Mobile: Home Email:
Person 3		Work: Fax: Mobile: Home: Email:
Person etc		Work: Fax: Mobile: Home: Email:

B5 Service Provider other resources that may be required

Name	Position	Contact information
Other Resources		
Person 1		Work: Fax: Mobile: Home: Email:
Person 2		Work: Fax: Mobile: Home Email:
Person 3		Work: Fax: Mobile: Home: Email:

Name	Position	Contact information
Other Resources		
Person etc		Work: Fax: Mobile: Home: Email:

B6 Service Provider Area Offices and Locations

Name	Position	Contact information
Office 1		Work: Fax: Mobile: Home: Email:
Office 2		Work: Fax: Mobile: Home Email:
Depot 1		Work: Fax: Mobile: Home: Email:
Depot 2 etc		Work: Fax: Mobile: Home: Email:

B7 HA Area and Regional Contacts

Name	Position	Contact information
	Duty Press office	Work: Fax: Mobile: Home: Email:

Name	Position	Contact information
	RCC Network Operation Manager	Work: Fax: Mobile: Home: Email:
	Area Performance Manager	Work: Fax: Mobile: Home: Email:
		Work: Fax: Mobile: Home: Email:

APPENDIX C DEFINITION OF MAJOR INCIDENTS

Major Incidents are any emergencies that require the implementation of special arrangements by one or more of the emergency services, the NHS or the local authority for: -

- The rescue and transport of a large number of casualties.
- The involvement either directly or indirectly of large numbers of people.
- The handling of a large number of enquiries likely to be generated both from the public and the news media usually to the Police.
- The large scale deployment of the combined resources of the emergency services.
- The mobilization and organization of the emergency services and supporting organizations, e.g. Local Authority, to cater for the threat of death, serious injury or homelessness to a large number of people.

The police or other emergency services will usually declare a major incident and notify the Highways Agency through service providers network control centres or similar.

APPENDIX D DEFINITION OF CRITICAL INCIDENTS

Critical incidents are unforeseen events that seriously impact upon the Highways Agency and its ability to deliver its 'safe roads, reliable journeys, informed travellers' objective. Importantly, the police, other emergency services or local authorities may not consider these types of incident as important as the Highways Agency.

Critical incidents also include incidents of which ministers wish to be informed.

It should be noted that critical incidents might be, or become, major incidents.

Service providers declare critical incidents for their own and the Highways Agency management purposes. If service providers believe that critical incidents are or may become major then they should notify the police immediately.

The following are deemed to be critical incidents:

1. Multiple collisions involving fatalities, serious injuries or vehicles disabled on a carriageway.
2. Partial or full closure of motorways or trunk roads due to weather or road conditions. This will also include minor incidents occurring at differing locations aggravated by other circumstances, which taken as a whole fall into this category.
3. Collisions involving crossover of a vehicle from one carriageway to another.
4. Collisions involving passenger coaches, school minibuses, trains, or public service vehicles resulting in fatalities or injuries.
5. Fatal collisions involving fire
6. Serious collisions involving a vehicle carrying dangerous substances (e.g. hazardous chemicals, flammable liquids such as petrol, radioactive materials, etc)
7. Collisions on motorways or trunk roads resulting in serious/potentially serious structural damage (e.g. to a bridge) necessitating road closures
8. Fatal collisions on motorways or trunk roads where road works are in progress
9. Any significant event impacting partial or full closure of motorways or trunk roads due to collisions, security alerts or criminal/terrorist acts. (NILO must ensure that TRANSEC is advised of security alerts)
10. Any incident off or adjacent to the network that may meet any of the above criteria, and affects the network.
11. Any incident or event off the HA network which results in stationary vehicles for a period of 1 hour or more.
12. Suicide or attempted suicide resulting on the closure of lanes or carriageways.
13. Roadworks over running by 30 minutes or more, and likely to have an impact on the network.
14. Any instances of 50% of the '**reserve**' winter maintenance fleet being utilized within any area.
15. The provision of welfare support.

Criteria for reporting an incident to the Minister

The Minister only needs to be informed about the most serious incidents on our network, such as the Selby train crash or the Kegworth air disaster, where there are multiple fatalities or issues of national significance.

The Ministers office also wants to be informed about the following:

- Significant accidents involving a school minibus whether resulting in fatalities or not
- Any serious accident involving a vehicle carrying dangerous substances e.g.: chemicals, inflammable liquids such as petrol or radioactive materials
- Major closure of motorways or trunk roads due to accidents, weather or road conditions and other incidents, where serious congestion is likely or has occurred
- Death or serious injury of an HA employee or contactor

HA officials also need to be told about the most serious incidents. However, where there is significant damage to roadside furniture or, where there are emergency closures causing significant delays, the relevant Divisional Director should be informed only when the HA Duty Officer is unobtainable.

APPENDIX E GLOSSARY

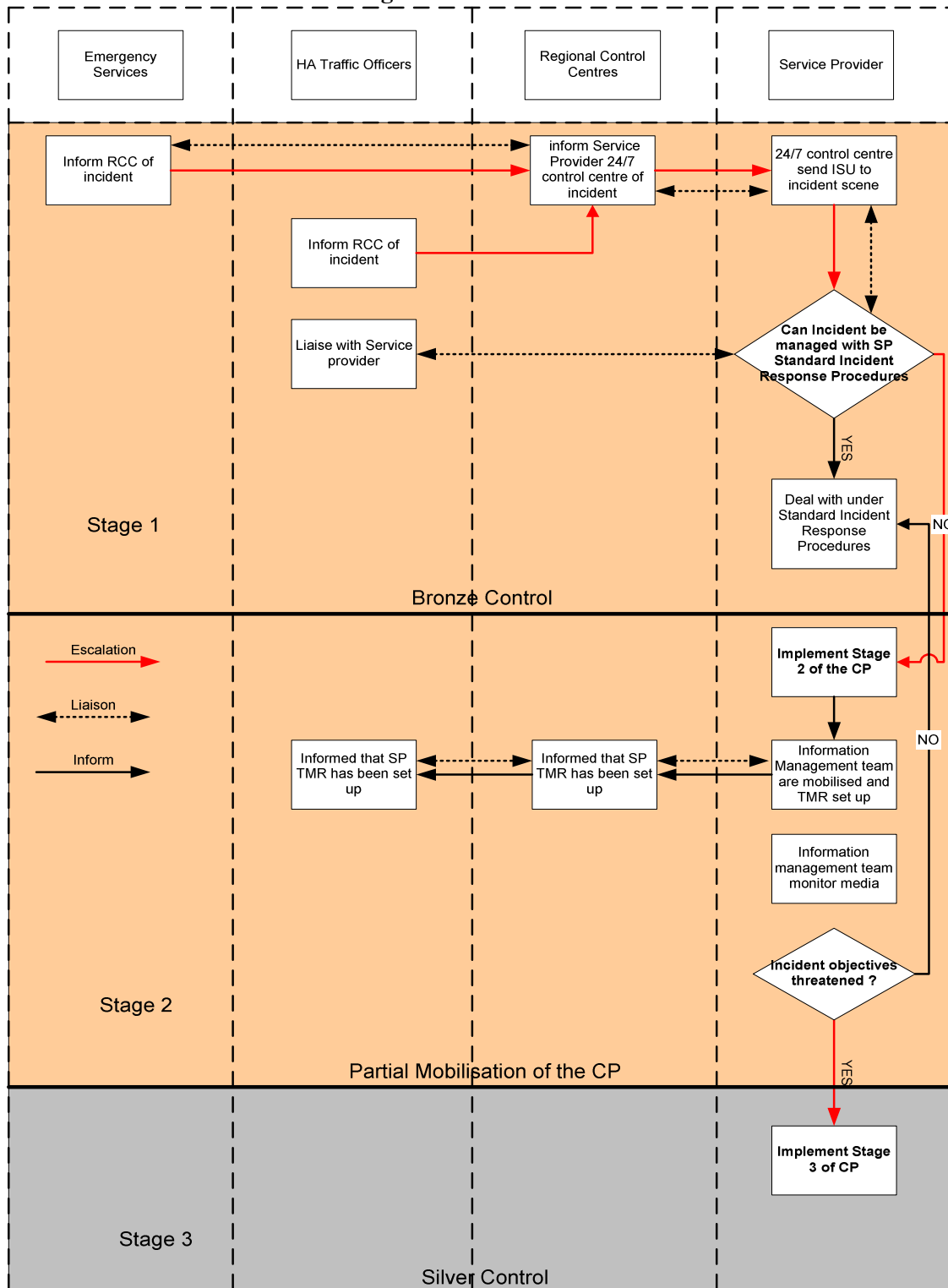
This is an example of a glossary but should be modified to suit the contents of the Service Providers own plan.

ACPO	Association of Chief Police Officers
AMM 70/06	Highways Agency "Area Management Memo"
Bronze Level Response	On site incident management by Emergency Services Officer in Charge/Traffic Officer/Service Provider
Box of reference	A box that contains reference information about the network and also Operational and Major Stakeholder Emergency Plans.
Contingency Plan Response	The highest level of Area response to incidents
Control Centre	May be called by another name on other Areas, but is essentially a 24/7 communication service which deploys the Service Providers ISU's
CP	Service Providers Contingency Plan
Diversion route	A pre-planned route to take traffic away from an incident site
ECP	Highways Agency "Emergency Contact Procedures"
Standard Incident Response Procedures	Service Provider established plans for dealing with routine Network incidents
Gold Level Response	Strategic Management of the incident by HA Area teams
HA Area Team	Highways Agency Area performance Managers team
Implementation Criteria	The circumstances in which the Contingency Plan will be implemented
ISU	Service Providers Incident Support Unit. These will attend the scene of an incident
IMT	Service Providers Incident Management Team
NILO	HA National Incident Liaison Officer
NTCC	National Traffic Control Centre
Process Flow Chart	A diagram showing the procedures to be followed in the event of an incident
RCC	Highways Agency Regional Control Centre (RCC)
Service Provider	Managing Agent
Silver Level Response	Tactical Control
Stakeholder	An organisation with a vested interest in the efficient performance of the Area network, which should be informed of incidents which may affect them or their business.

Strategic Network	The HA Area motorways and trunk roads
SIMF	Highways Agency "Standard Incident Management Framework"
Tactical Management Team	Team of Service Provider personnel responsible for the Tactical Management of an incident
Tactical Management Room	A designated room where the incident can be managed without interference from other day to day business. Should be fully functional with all equipment required to manage an incident.
TO	Traffic Officer, from the Highways Agency Traffic Officer Service.

APPENDIX F EXAMPLE OF A PROCESS FLOW CHART

Figure F.1: Process Flow Chart



Annex 7.17.1 Identification of Canine Fatalities Form

Date:	
Time:	
Location:	

Colour	
Small (height to shoulder <30cm)	
Medium (>= 30 cm <45cm)	
Large (>45cm)	
Coat type (short, long or curly)	
Distinguishing marks	
Collar type/colour	
Identity Disc/ Owners Details	
Ear Tattoo Details	
ID Chip No	

Owner notified	
Police notified	
Local authority dog warden notified	
PetLog notified	
Nat. Dog Tattoo Reg. notified	

Contact Details

PetLog: www.thekennelclub.org.uk/caring/petlog.html

National Dog Tattoo Register: www.dog-register.co.uk/
Tel: 01255 552455
Email: tattoo@dog-register.co.uk

Annex 7.18.1 Rapid Re-opening of Running Lanes Following Diesel and other Hydrocarbon Spillages - Risk Example

This risk table gives the first consideration on the overall risk generated by a diesel incident following spillage from a Large Goods Vehicle involved in a serious injury incident.

Table Annex 7.18.1 Completed Risk Matrix Table

	Impact	Low (1)	Medium (2)	High (3)
Probability				
Low (1)		A	E	
Medium (2)			C	B
High (3)			D	

Risk

- B. Spillage of diesel as a result of recovery
- C. Excessive treatment of the pavement for the level of damage
- D. Skid potential
- E. Rutting
- F. Binder loss leading to break up of pavement material

Overall risk figure:

A= 1x1	= 1
B= 2x3	= 6
C= 2x2	= 4
D= 3x2	= 6
E= 1x2	= 2
Total figure	=19

A total figure of 19 indicates that options of no treatment, or absorbent and grit sand methodology, might not be appropriate.

Risk A

The potential for a future spillage from a diesel container has already been classified at the lowest possible level, therefore it cannot be reduced.

Risk B

Excessive treatment may score high if vehicles involved in an incident prevent a full consideration of the impact and effect of the diesel spillage on the pavement.

Risk C

Scoring risk C, skid potential, at 4, indicates concern over diesel on the pavement. If an absorbent is applied this may reduce the concern so that it may be reclassified, in a future assessment.

Risk D

Rutting may be a concern at the outset, but if no ruts are evident, then this risk score can be reduced. Rutting will take time to occur, unless the pavement has been extensively damaged, so a reduced risk score should not represent a reduction in the level of service provided to motorists. Monitoring should follow re-opening and treatment planned if rutting becomes evident.

Risk E

The diesel may not have been on the carriageway long and the potential for it to have affected the binder to any significant extent is considered minimal. However, if the diesel had collected in an existing defect location, such as a pothole, there is a potential for localised effects to be more severe and have an impact on the clearance of the diesel and re-opening of running lanes.

Annex 7.18.2 Rapid Re-opening of Running Lanes Following Diesel and other Hydrocarbon Spillages - Possible Treatment Options

In order of least time required to implement treatment and likely resultant delay to motorists:

- Nothing
- Grit sand
- Absorbent and grit sand
- Wash / jet wash
- Detergent and wash / jet wash
- Infra-red heating (still under testing)
- Plane and Pave
- Other

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7.1 Incident Management – Introduction and Scope

7.1.1 Background

Incident Management and Congestion

It is a fact that incidents on the network are a significant cause of disruption to traffic flow with the associated delay and congestion. Various studies have considered the causes of congestion and it is generally accepted that incidents contribute around 25% to the overall congestion levels on the motorways and trunk roads in England.

Move from builder, to maintainer, through to operator

The role of the Highways Agency has been evolving since it was created in 1994. The primary role of the Highways Agency was as a road builder, continuing the development of the strategic road network. The emphasis of the role changed to encompass the role of road maintainer and, more recently, a new role as road operator which was established in the 1998 White Paper, a New Deal for Transport. There are a number of different factors some of which are discussed below.

The Roles & Responsibilities Review 2002

The 2002 Roles and Responsibilities Review, undertaken jointly with Association of Chief Police Officers (ACPO), sought to gain agreement about the range of services which should be provided to the users of the Highways Agency's core network; identify which of these services are best provided by the police, the Highways Agency, or an alternative supplier; and establish the implications of any transfer of responsibilities. The Roles and Responsibilities Review led to the creation of the Roles and Responsibilities Programme and the subsequent implementation of the Traffic Officer Service, which is employed by the Agency to provide its first response to incidents or events on the HA network.

The Incident Management Study 2002

The Incident Management Study was undertaken in 2002. Whilst recognising the potential for greater multi-agency cooperation, the study sought to gain a better understanding of what happens during major incident clearance, the roles and responsibilities of those organisations taking part and to provide recommendations for improvement. The recommendations of the Incident Management Study included: the Highways Agency taking a key role of developing, negotiating, implementing and monitoring better incident management procedures, a National Guidance Framework (NGF) for incident management culture, procedures and processes and Detailed Regional Operating Agreements (DROAs) to meet the needs of the area.

Civil Contingencies Act 2004

The Civil Contingencies Act 2004 sets out a framework for managing emergencies and defines the powers, responsibilities and duties. The Highways Agency is a 'Category 2' responder under the Act which supersedes a number of older statutes and was brought in mainly as a result of the fuel crisis and the severe flooding in the autumn and winter of 2000 and the outbreak of Foot and Mouth disease in 2001.

Traffic Management Act 2004

The Traffic Management Act 2004 implemented a range of new measures to reduce congestion on both the strategic and local road networks including the introduction of powers for Traffic Officers, a new Network Management Duty for local traffic authorities and permits schemes for controlling the occupation of highways. In addition, the Act introduced a number of amendments to the New

Roads & Street Works Act 1991 and the Highways Act 1980. Clearly the most significant provisions within the Act for the Agency were those contained in Part 1 dealing with Traffic Officers.

The Traffic Officer Service

In April 2004, the Highways Agency introduced a pilot of the Traffic Officer Service in the West Midlands as part of the Roles and Responsibilities programme, providing a successful working partnership with the regional police forces and an operational presence on the network. This has introduced a more robust framework within which improvements in areas such as traffic incident management can be made.

The Traffic Officer Service has given the Highways Agency a physical presence and influence over the management of incidents on the network and was therefore a key point in the transformation journey for the Highways Agency from being an asset owning organisation to a service focused, asset operator.

The PSA Target

In 2006 the Agency was set a key Public Service Agreement target of making journeys on the strategic road network more reliable by 2007/08

Emergency Customer Welfare

Traffic incidents, periods of increased demand and severe weather events are among the most common causes of delays which can result in persons, pet animals and livestock becoming stranded on Highways Agency roads.

The best way to reduce the impact of delays is to employ recognised incident management techniques and clear incidents as quickly as possible. However, there are occasions when severe congestion and extended delays are unavoidable and can result in causing unacceptable discomfort or suffering to those stranded. Under these circumstances, it could become necessary for 'on site' provision of basic emergency welfare, or in extreme circumstances, the evacuation of persons/animals from trapped vehicles to enable welfare support elsewhere.

In July 2006, following recommendations resulting from a detailed study, the Highways Agency Board gave its approval for the development and subsequent introduction of policy guidance and a service capability for delivery of basic, emergency welfare to stranded motorists. This has resulted in the development of formal arrangements for providing Emergency Customer Welfare (ECW).

Guidance on the policy is provided in 'Provision of Emergency Customer Welfare on Motorways and All Purpose Trunk Roads – National Policy Guidance' which can be accessed for viewing and download on both Highways Agency Portal and www.ha-partnet.org.uk website using the following links:

Portal: [Emergency Customer Welfare](#)

PartnerNET: [Emergency Customer Welfare](#)

7.1.2 Scope

Incident management covers a wide spectrum of activity ranging from the removal of debris from the carriageway through to responding to national crises. The scope of this document extends across this spectrum. The particular arrangements to be put in place for dealing with incidents will clearly vary depending on the size and scale of the incident: this document sets out a standard set

of operating protocols and a clearly defined escalation process to ensure all incidents are managed appropriately.

The Agency's Standard Incident Management Framework (See Annex 7.8.11) gives a strategic overview of the command and control structures for managing incidents on the network and provides guidance on the roles and responsibilities of Highways Agency staff involved in incident management.

The family of Contingency Plans (Service Provider, Regional Control Centre and National Crisis Management Plans).

The Incident Management Service Manual defines all of the incident related services provided by the Highways Agency's Service Providers.

The majority of incidents will be lead by Traffic Officers or the Police and this document sets out the established operating protocols in place between these organisations. The document does not however define the wider service provided by the Traffic Officer Service or their specific operating procedures or arrangements.

7.1.3 Objectives

The objective of this document is to provide a clearly defined and consistent set of arrangements for delivery of the Highways Agency's incident management service. In defining these arrangements the Highways Agency is seeking a level of consistency in the service delivered on the network across the whole country.

The document pulls together a range of disparate documents that have been developed over time and provides a single point of reference to the incident management service.

7.1.4 Audience

The primary audience for this document is the Highways Agency's Service Providers and those members of the Highways Agency's Area Performance Teams responsible for managing the Service Provider contracts.

The document is also essential reading for Traffic Officers and RCC staff as the operating protocols between Network Operations and the Area Performance Teams (and their Service Providers).

7.1.5 Structure

The Incident Management Service Manual forms Part 7 of the Highways Agency's Network Management Manual (NMM).

The document is divided into a number of sections. Sections 2 and 5 deal with responsibilities and communications and set out the agreed operational protocols between the various parties involved in the management of incidents on the network. Section 3 discusses the definitions of incidents. Section 4 provides information for dealing with the media following an incident. Section 6 is concerned with contingency planning to deal with incidents. Section 7 is structured on the standard incident 'timeline' and defines the service requirements at each stage of an incident. Section 8 deals with methods of debriefing following an incident. Sections 9 to 12 define the service requirements and the service standards the Highways Agency has defined for its incident management service. Sections 13 to 17 address particular aspects of the incident management service in further detail.

The Incident Management Service Manual has subsumed a number of incident management related documents and these are listed at Section 7.18. The Incident Management Service Manual has a number of associated key reference documents, which are also listed at Section 7.18.

7.2 Roles and responsibilities

7.2.1 Introduction

The principal responding partners for incident management on the Highways Agency's network are **the Highways Agency** and its Service Providers, **Police, Fire & Rescue Services** and **Local Authorities**. It is principally these agencies which interact in the detection, verification, response, scene management, recovery and restoration phases of incidents. The Highways Agency and its Service Providers each have a number of functional areas within their organisations, and each of the other responders will have their own particular local organisational arrangements.

Police and Fire & Rescue Service all manage incidents through their control offices. Local Authorities' organisational arrangements vary widely across the Network. Relevant Highways Agency and Service Provider staff are to approach incident manager partners to become aware of their local arrangements.

The overall roles of the principal responding partners are set out below, identifying the key functional areas within the organisations in relation to incident management. The responsibilities of each of the various functional areas of the Highways Agency, Service Providers and the Police are also described. A more detailed outline breakdown of the roles and responsibilities of the Highways Agency, Service Providers, Police, Fire and Rescue Service and Local Authorities is set out in Table 7.2.1.

7.2.2 Highways Agency

The Highways Agency's overall role is to provide proactive network management for both routine operations and incidents. This role is fulfilled through a number of functional areas provided both directly by the Highways Agency and through its Service Providers. The Highways Agency is the lead responder in all 'HA led incidents' – essentially those incidents where there is no injury or alleged offence, who's aim is to manage congestion, ensure rapid and safe removal of obstructions and support road-users in need of assistance. The Traffic Operations Director is responsible to the Chief Executive for the effective preparation for, and management, of major incidents. This responsibility cascades through Traffic Operations to Area Performance Managers who are responsible for ensuring an appropriate and co-ordinated approach to emergency management across their area.

All Highways Agency and Service Provider functions listed are activated in respect of all incidents. The Highways Agency Roles of National Incident Liaison Officer (NILO), Senior Officer on Call (SOOC) and Crisis Management Team (CMT) are only activated during non-routine incidents, as indicated in diagram 7.2.1.

- Traffic Officer Service – The Highways Agency's Traffic Officer Service supports the Highways Agency's three aims of safe roads, reliable journeys and informed travellers through using the powers within the Traffic Management Act to maintain or improve the movement of traffic, prevent or reduce congestion, avoid damage and prevent damage. The Traffic Officers are supported by seven Regional Control Centres (RCCs). Integrated RCCs are manned and operated by both Highways Agency and police staff. In some cases, Service Providers' 24 hours a day, 7 days a week service can be co-located within the RCC.
- Traffic Officers – Traffic Officers are empowered to operate on the Highways Agency's road network to reduce congestion and promote the objectives of road safety. The Traffic Management Act makes clear that the powers of a Traffic Officer are to provide for movement of traffic, reduce congestion, avoid danger, and prevent damage.

- Regional Control Centre (RCC) – The RCCs are the focal point for all communications regarding planned and unplanned events, such as incidents and emergencies, on the Highways Agency’s network. RCCs gather and assess regional network information and deploy and coordinate resources to manage both the network and criminality. RCCs manage and monitor traffic and control electronic signs on the roads in conjunction with the National Traffic Control Centre (NTCC).
- Area Performance Teams – The Highways Agency’s Area Performance Teams manage the network performance, budgets and contracts. During incidents, these teams provide specialist advice to the Highways Agency’s Traffic Officer Service (RCCs and Traffic Officers), Service Providers and any other agencies involved in the incident. This may require the Highways Agency advising the police or any other Emergency Services involved in the incident on certain aspects regarding the network
- National Traffic Control Centre (NTCC) – The primary function of the NTCC (operated by Traffic Information Services Limited) is to collect, process and distribute strategic (wide-area) traffic information, including setting strategic roadside variable message signs (VMS) and other dissemination media, using pre-agreed protocols, to assist travellers in planning their journeys. The NTCC also supports the Highways Agency and its operational partners in optimising the use, management and operation of the network.
- National Incident Liaison Officer (NILO) – The NILO, based at the NTCC, is responsible for receiving information from within the Highways Agency and its Service Providers about critical and major incidents, sharing information with Regional Control Centres, Service Providers, Area Performance Teams, NTCC, Press Office and others where appropriate and when necessary escalating incidents and informing senior management.
- Senior Officer on Call (SOOC) – The SOOC is a Highways Agency resource at a senior level who is on call to be alerted of critical and major incidents during non-office hours to monitor the management of the more serious critical incidents (in line with defined criteria) and take responsibility for liaising with the Press Office and appropriate escalation where required. The SOOC does *not* take command of the incident management except where they are the designated officer responsible for taking command as a result of an escalation in the incident command level.
- Crisis Management Team (CMT) – The role of the CMT is to act in the event of a major incident and to co-ordinate and focus the response. The CMT will act to ensure that the Highways Agency can continue to exercise its core functions by limiting the impact of a crisis or major incident in the event of an emergency, so far as is reasonably practicable. The CMT is formed by designated Highways Agency staff at board level, supplemented as necessary by designated senior Highways Agency specialists.

7.2.3 Service Providers

The Service Providers along with Traffic Officers are responsible for dealing with incidents at an operational level, providing support to the Highways Agency and other responders involved in the incident, providing tactical incident management such as traffic management (see contingency plan section) when required, and undertaking asset maintenance or repair required as a result of incidents.

The principal requirement for Incident Management is the provision and use of an incident management team, comprising on- and off-road services, which have the information, and the authority to provide an effective response at the incident.

Service Provider requirements:

- Incident Management Team – The principal requirement is the provision and use of an incident management team which have the information and the authority to provide an effective response appropriate to the incident. The Incident Management Team must include suitably qualified staff to support, direct and advise incident response services. The Incident Management Team must include a 24 hours a day, 7 days week service to ensure that the Service Provider can be contacted immediately when an incident occurs. This service can be co-located within the RCCs. The Service Provider must complete their contingency plans, which details how the Service Provider will escalate an emergency response from Operational (Bronze) to Tactical (Silver) and Strategic (Gold) levels, on occasions when that is needed. The contingency plan is designed to ensure that they, together with the Traffic Officer Service and Area Performance Teams, are able to make a proper response to the situation in order to support the actions and requests of the emergency services, ensure that proper interfaces are achieved with other organisations, and ensure that nuisance to the Highways Agency's customers and major stakeholders are minimised. More details are given in the Standard Incident Management Framework (Annex 7.8.11).
- Incident Support Unit (ISUs) – The purpose of an ISU is to minimise disruption to road users, by providing assistance to the Traffic Officer Service and the Police and by providing a safe and timely response to incidents and clearance of the carriageway to restore normal service. Whilst many different types of incidents occur on the strategic road network, there are a number of basic functions, defined below, which must be carried out by an ISU at the scene of most incidents. The primary functions of ISUs are:
 - (i) Support the Traffic Officer Service and Police when requested with the management of incidents,
 - (ii) Assess the incident scene and procure the attendance of additional or specialist resources where the task is beyond the ISU's capabilities,
 - (iii) Provide a communications link between the incident scene and the Service Provider's Network Control Centre, or equivalent.
 - (iv) Make the incident scene safer through the application of appropriate traffic management,
 - (v) Relieve congestion and remove hazards to safety by the clearance of debris from traffic lanes and hard shoulders,
 - (vi) Undertake repairs to the highway infrastructure which has been damaged as a result of an incident,
 - (vii) Proactive measures to minimise damage to infrastructure and environment, and
 - (viii) Detection of incidents and reporting.

When not engaged in fulfilling the primary functions, the ISU can be employed on secondary activities such as:

- (i) Patrolling, monitoring and reporting on the network,
- (ii) Undertaking routine maintenance, and
- (iii) Making safe defects to the highway infrastructure.

These secondary activities must not compromise the response to incidents or impact upon the required response times as detailed at Section 7.9. Other requirements in relation to Incident Support Units are covered within the relevant sections.

- Secondary Response – The purpose of secondary response is to provide additional services, resources and equipment which are not provided by the ISU. This will offer increased facilities and capabilities for clearance of the carriageway to restore normal service. Secondary response times are included at Section 7.12.

7.2.4 Police Service

The police are responsible for intelligence-led targeting of criminal activity, alongside their roles in managing incidents involving death or injury, threats to public order and public safety or incidents requiring significant coordination of the emergency services. The police are the lead agency in all incidents requiring the powers and skills of a Police Officer and falling within the general responsibilities of the police; these incidents are known as 'police-led incidents'.

The police co-ordinate all the activities of those responding at and around the scene, which must, unless a disaster has been caused by severe weather or other natural phenomena, be preserved to provide evidence for subsequent inquiries, possible criminal proceedings and any coroners inquests. Where practicable the police establish cordons to facilitate the work of the other emergency services in the saving of life. They facilitate inquiries carried out by the responsible accident investigation body, such as the Health and Safety Executive, Railway Inspectorate or the Air or Marine Accident Investigation Branch. The police process casualty information and have responsibility for identifying and arranging for the removal of the dead. In this task they act on behalf of HM Coroner who has the legal responsibility for investigating the cause and circumstances of deaths arising from a disaster.

- Police Scene Command – The Police Commander at the scene is responsible for the co-ordination of all responders dealing with the incident itself. This does not include responsibility for the co-ordination of the response to traffic delay and congestion, or its consequences, unless the incident is, or becomes, a *Major Incident*.
- Police Incident Handling Centres – The roads controlled by each Highways Agency RCC are covered by a number of policing areas. These areas typically feature one or more Police Incident Handling Centres (PIHC). When information that an incident has occurred is received, police resources are deployed and are controlled from the PIHC. In relation to the network, the incidents controlled by the PIHC are major incidents and 'police led' incidents. The PIHCs receive information from the public and other agencies. Currently, all '999 calls to the Police from mobile phones made by motorists using the network, are routed to the PIHCs. The PIHC coordinates information flow and the response to 'police led' incidents.

Service Providers should also be aware of a number of specialist support services that can directly assist with incident resolution. These services will normally be requested by the on-scene Police Commander .

7.2.5 Fire and Rescue Service

In relation to the Highways Agency's network, the first concern of the fire service is to rescue people trapped in a fire, wreckage, or debris. They will prevent further escalation of the incident by extinguishing fires, or undertake protective measures to prevent them. They will deal with released chemicals, or other contaminants in order to render the incident site safe. They assist the ambulance service with casualty handling and the police with recovery of bodies. The fire service is responsible for the health and safety of personnel of all key agencies working within the inner cordon and will liaise with the police about who should be allowed access, to ensure that they are properly equipped, adequately trained and briefed. However, in the event of any situation which is, or which is suspected to be, the result of a terrorist incident, all activities within cordons are under the direct control of the police.

7.2.6 The Ambulance Service

In relation to the Highways Agency's network, the functions of the Ambulance Service are to respond to emergency calls in respect of sick and injured people and to provide on-scene first aid and triage services as appropriate.

The Ambulance service has responsibility for co-ordinating the on-site National Health Service response and determining the hospital(s) to which injured persons should be taken, which may depend on the types of injuries received. If necessary, the ambulance service will seek the attendance of the Medical Incident Officer.

7.2.7 Local Authorities

Local authorities will have a wide range of control centres to manage the traffic on local roads and to coordinate with other road authorities, depending on their needs. In relation to the Highways Agency's network, the Local Authorities will provide NTCC and RCCs with information, coordinate LHA VMS signs and signals with NTCC and RCCs, and manage emergency local diversions within the LHA network. Local authorities, as a category 1 responder under the Civil Contingencies Act, are responsible for providing for the welfare of people involved in emergencies. Other Local Authorities' responsibilities are managing traffic on their network and fulfilling the network management duty under the Traffic Management Act.

In the immediate aftermath of a disaster the principal concerns of local authorities are to provide support for the emergency services, continue normal support and care for the local and wider community, use resources to mitigate the effects of the emergency and co-ordinate the response by organisations other than the emergency services.

As time goes on and the emphasis switches to recovery, the local authority will take a leading role to facilitate the rehabilitation of the community and restoration of the environment. Even a relatively small disaster may overwhelm the resources of the local authority in whose area it occurs. Against this possibility, plans are made which will, in appropriate circumstances, trigger arrangements for mutual aid from neighbouring authorities, delivering cross boundary assistance if required. Arrangements may range from simple agreements to offer whatever assistance is available in the event of an incident, to more formal arrangements for the shared use of resources, which could include vehicles, equipment and people.

7.2.8 Other Responders

In addition to the responders referred to above there are a number of other responders who will be involved in incident management including vehicle recovery operators, the Environment Agency, waste disposal contractors and the national chemical emergency centre. Their responsibilities are as follows:

- **Vehicle recovery operators** are currently contracted to and managed by the police to deal with broken down, damaged and abandoned vehicles in accordance with the instructions they are given.
- **The Environment Agency (EA)** is responsible for protecting and improving the environment, offering advice in managing waste and dealing with pollution. It is the prosecuting authority in cases where legislation has not been complied with, and has key responsibilities for maintaining and operating flood defences on rivers and coastlines. These responsibilities cover direct, remedial action to prevent and mitigate the effects of the incident, to provide specialist advice, to give warnings to those likely to be affected, to monitor the effects of an incident and to investigate its cause. The EA also collects evidence for future enforcement or cost recovery. The involvement of the EA may be sought by the Highways Agency or the Police, or they may become involved themselves. They do not undertake any operations themselves, and the incident scene commander will be responsible for managing the actions of EA staff at the scene. The Fire and Rescue Service are the Environment Agency's on road agents and now have a mandate to consider environmental aspects of incidents.

- **Waste disposal contractors** are responsible to and managed by Service Providers to manage waste which has caused or results from incidents. Alternatively they may be directly employed by the person/organisation responsible for the waste material, in which case they will be responsible to the Police or the TO Service when working within an incident site.
- **National Chemical Emergency Centre (NCEC)** plays a key role in national arrangements for responding to chemical incidents. It provides a 24 hour national advice service to the public emergency services on dealing with chemical incidents and is a central part of the Chemical Industries Associations CHEMSAFE scheme.
- **Health Authorities** contract with NHS Hospital Trusts, Community Health Trusts, Ambulance Trusts and General Practitioners to ensure an effective health response in the event of a disaster. They have overall responsibility for public health within their geographical areas and are therefore required to have arrangements in place for the control of communicable diseases and non-communicable environmental hazards.

Hospitals with Accident and Emergency Departments (identified by their Health Authorities as potential casualty receiving hospitals) respond to requests from the ambulance service to accept casualties for medical treatment and to provide appropriately trained staff to act as Medical Incident Officers and Mobile Medical Teams.

- **HM Coroner.** The role of the coroner is defined by statute and they have a statutory duty to hold an inquest into all road traffic deaths. The role of the coroner and the purpose of an inquest are to determine:
 - The identity of the deceased;
 - When and where death occurred;
 - The medical cause of death;
 - How and by what means the deceased came by death;
 - The particulars required to register death..

The duties of coroners do not vary with the number of people who are killed, or the circumstances in which the deaths occur. In some cases coroners may want to attend the collision scene, particularly if the case is unusual or high profile. This would be discussed and established at a local level with the police in what circumstances the coroner would wish to attend.

Only the coroner may authorise the moving of a body at the scene of an incident and only the coroner may authorise a post-mortem and the release of a body to relatives. If a body requires extracting from a vehicle, the coroner's agreement must be obtained, especially if the extraction is likely to occur in an adjoining jurisdiction. The police act as the coroner's officers when investigating fatalities arising from an incident.

- **HM Coastguard Agency** comprises two elements - HM Coastguard and the Marine Pollution Control Unit. The primary responsibility of HM Coastguard is to initiate and co-ordinate civil maritime search and rescue within the United Kingdom Search and Rescue Region. This includes mobilising, organising and dispatching resources to assist people in distress at sea or in danger on the cliffs or shoreline. Local coastal safety committees based on police force boundaries ensure effective co-ordination of resources between police and coastguard for land based incidents on or adjacent to coastlines. The Marine Pollution Control Unit is responsible for dealing with pollution at sea and, in conjunction with local authorities, for the shoreline clean up.
- Bona fide **volunteers** can contribute to a wide range of activities, either as members of a voluntary organisation or as individuals. They will always be under the control of a statutory authority.

- **Military** assistance can be sought to support the civil authorities. This has been an important part of many disaster responses in the past. The police will normally contact the Military, but they are likely to be some distance away from the scene and so road transport will be their primary method of getting large scale equipment and personnel to the site.
- **Central government** has a role in providing advice or support to the local response and to keep Parliament informed of progress.
- **Industrial, or commercial organisations**, including the utilities, may play a direct part in the response to disaster if their personnel, operations, or services have been involved. They may provide support, for example by providing equipment, services or specialist knowledge.

TABLE 7.2.1

OUTLINE OF INCIDENT MANAGEMENT RESPONSIBILITIES							
FUNCTION	HIGHWAYS AGENCY				LHA	Police	Fire & Rescue Service
	Area Performance Team	Service Provider	Traffic Officer Service	NTCC			
Management Responsibility	Asset management Strategic command when incident is escalated to gold under Area Contingency Plan Management/monitoring of Service Provider performance	Provide and use the necessary operational expertise. Support silver command when required. Assume silver command if outside TO Service operational area. Trigger escalation of incident management to a strategic (Gold) level when required if outside TO Service operational area.	Management of the Traffic Officer Service. Regional focus for operational traffic management	Primary source of Traffic Information on core network. Strategic VMS setting.	Manage and maintain the LHA network. Network Management Duty	Protection of life. Prevention and detection of criminality. Preservation and investigation of the scenes of crime.	Extinguishing and controlling fires Protecting the environment Rescuing trapped and injured persons
Information Flows	Highways Agency internal communications in accordance with procedures and protocols	Provide a 24/7 response service to the RCC Update NTCC/RCC on current status of events. Direct ISUs to incidents	Receiving information from Service Provider NCC and NTCC, and updating NTCC on current status of events in their field of operations.	Primary route flow of all traffic data, incoming and outgoing – interfacing with the media, Traffic Officer Service, Service Providers, LHAs, etc.	Provide traffic information to media etc, advising on local road conditions and alternative routes.	Provide to the media etc non-traffic information on all roads, Provide relevant incident information to LHAs for their networks and to NTCC.	Co-ordination with incident command (Police or RCC as applicable)
Incident Management Responsibilities	Determine optimum timing for infrastructure repairs Operational implementation of Service Provider and Regional Contingency Plans Strategic command if incident is escalated to gold (except where Crisis Management Plan is implemented). Service Manager and team may take strategic control of the incident from the RCC or delegate this responsibility to the RCC to make strategic decisions where required.	Support Police/RCCs in incident management for the core network. Providing relevant incident information to NTCC/RCCs and specific information as required by the Area Performance Team Manage Service Provider's operations and ensure that the right resources are provided Provide other on road support requested by the emergency services or the TO Service	Co-ordinate the responses of emergency services, Service Providers and other agencies Take strategic control of the incident if requested to do so by the HA APM's. Provide incident information to NTCC for dissemination to LHAs and other interested parties. Operational implementation of Area and Regional Contingency Plans	Support Police and RCCs in incident management and LHA on defined network.	Support Police in incident management for LHA network and provide NTCC with information where it has an impact on the core network.	Command and control of incident scene, None for HA-led incidents in parts of network where Traffic Officer Service operates Crime scene investigation Facilitate inquiries carried out by the responsible bodies, such as the Health and Safety Executive, Environment Agency, Railway Inspectorate or the Air or Marine Accident Investigation Branch. Process casualty information and have responsibility for identify and arrange for the removal of the dead.	Command and control of incident scene while fire is the predominant factor. Dealing with released chemicals, or other contaminants in order to render the incident site safe. Assisting the Ambulance Service with casualty handling and the Police with recovery of bodies. Taking responsibility for the health and safety of personnel of all key agencies working within the "inner" cordon
Congestion Management	Support T O Service in implementing the Area and Regional Contingency Plans. Support and monitor Service Provider's input to incident management	Support TO Service in implementing Contingency Plan and, if necessary, to provide welfare as directed	Monitor and manage traffic conditions Reduce the impact of incidents by working with Police and Service Providers, e.g. - stopping and directing traffic, removing vehicles after collisions, clearing up after traffic collisions	Monitor national network. Liaise with RCC and Police on other events on Network or on LHA networks which affect management of the incident. Implement strategic response to single event or multiple simultaneous events	Agree and establish tactical diversion routes. Liaise with T O Service to co-ordinate their responses and resources with those of the Service Provider as Highways Agency operational units	None	None
VMS & Other Traffic Diversion Measures	None	Monitor VMS signage as far as possible, and report any discrepancies.	Display messages on variable message signs (VMS) to warn drivers of the situation ahead and diversion routes In conjunction with the Police, control VMS and signals for tactical and local incident management and safety purposes.	Control VMS for wide area strategic traffic management purposes.	Coordinate LHA VMS signs and signals with NTCC.	Liaison with Traffic Officer Service to control VMS and signals for incident management and safety purposes.	None
Strategic Diversions	None	None	Monitoring Regional network and updating NTCC	Set wide-area diversions within core network for strategic traffic management purposes.	None	Update NTCC in accordance with DLOA	None
Tactical Diversions	Ensure, with LHAs, that they are established	Provide operational support, equipment and personnel for implementing tactical diversions as required.	Agree with LHAs in advance (where possible) if pre-agreed tactical diversions are to be used Implement tactical diversions.	None	Manage tactical diversions on agreed routes within the LHA network.	Implement tactical diversions outside the T O Service operational area.	None

NOTE: The information provided in this table is intended as an outline of responsibilities – it is not a definitive or exhaustive list, and does not override working instructions, procedures and protocol

7.3 Definition of Incidents

7.3.1 Introduction

As mentioned earlier, incidents range from simple removal of debris from a carriageway through to complex multi-agency national crises.

This section of the Network Management Manual sets out the definitions of incidents that are used throughout the remainder of the document.

The Police, other emergency services and Local Authorities have an established understanding of the term 'major incidents' and the term is used by Government to take powers to deal with such incidents. The term 'critical incidents' has also been established for those incidents that are important to a single organisation. So far as the Highways Agency, its' stakeholders and Service Providers are concerned, the term emergency should be regarded as a generic term encompassing both critical and major incidents. The term 'incident' should be regarded as the description of those occurrences that come to the attention of the Highways Agency and its' Service Providers.

7.3.2 Incident Types

There are two basic types of incident:

- Critical Incident
- Major Incident

The basic definitions of these incidents are as follows:

Critical Incidents

Critical incidents are unforeseen events that seriously impact upon the Highways Agency and its ability to deliver its 'safe roads, reliable journeys, informed travellers' objective. Importantly, the police, other emergency services or local authorities may not consider these types of incident as important as the Highways Agency.

Critical incidents also include incidents of which ministers wish to be informed.

It should be noted that critical incidents might be, or become, major incidents.

Service providers declare critical incidents for their own and the Highways Agency management purposes. If service providers believe that critical incidents are or may become major then they should notify the police immediately.

The following are deemed to be critical incidents:

1. Multiple collisions involving fatalities, serious injuries or vehicles disabled on a carriageway.
2. Partial or full closure of motorways or trunk roads due to weather or road conditions. This will also include minor incidents occurring at differing locations aggravated by other circumstances, which taken as a whole fall into this category.
3. Collisions involving crossover of a vehicle from one carriageway to another.
4. Collisions involving passenger coaches, school minibuses, trains, or public service vehicles resulting in fatalities or injuries.
5. Fatal collisions involving fire.
6. Serious collisions involving a vehicle carrying dangerous substances (e.g. hazardous chemicals, flammable liquids such as petrol, radioactive materials, etc).

7. Collisions on motorways or trunk roads resulting in serious/potentially serious structural damage (e.g. to a bridge) necessitating road closures.
8. Fatal collisions on motorways or trunk roads where road works are in progress.
9. Any significant event impacting partial or full closure of motorways or trunk roads due to collisions, security alerts or criminal/terrorist acts. (NILO must ensure that TRANSEC is advised of security alerts).
10. Any incident off or adjacent to the network that may meet any of the above criteria, and affects the network.
11. Any incident or event off the HA network which results in stationary vehicles for a period of 1 hour or more.
12. Suicide or attempted suicide resulting on the closure of lanes or carriageways.
13. Roadworks over running by 30 minutes or more, and likely to have an impact on the network.
14. Any instances of 50% of the 'reserve' winter maintenance fleet being utilized within any area.

Major Incidents

The term "major incident" is commonly used by emergency services personnel to describe events or situations which would constitute an "emergency" as defined in the Civil Contingencies Act (2004); this is the threshold of event or situation that will initiate a response under their major incident plans.

Major incident and emergency refer to the same threshold and are essentially interchangeable (Emergency Response and Recovery, Non Statutory Guidance to complement Emergency Preparedness, 2004). 'Emergency' is defined in section 1 of the Civil Contingencies Act as an event or situation which threatens serious damage to:

- 1a) Human welfare in a place in the United Kingdom
- 1b) The environment of a place in the United Kingdom, or
- 1c) The security of the United Kingdom or of a place in the United Kingdom.

A major incident is defined in the Association of Chief Police Officers Emergency Procedures Manual and Fire Service Major Incident Emergency Procedures Manual (1994) as:

"any emergency that requires the implementation of special arrangements by one or more of the emergency services, the NHS or the local authority for:

- *the initial treatment, rescue and transport of a large number of casualties;*
- *the involvement either directly or indirectly of large numbers of people;*
- *the handling of a large number of enquiries likely to be generated both from the public and the news media, usually to the police*
- *the need for the large scale combined resources of two or more of the emergency services;*
- *the mobilisation and organisation of the emergency services and supporting organisations, e.g. local authority, to cater for the threat of death, serious injury or homelessness to a large number of people."*

For specific National Health Service purposes (including ambulance services), a major incident may be defined as:

"Any occurrence which presents a serious threat to the health of the community, disruption to the service, or causes (or is likely to cause) such numbers or types of casualties as to require special arrangements to be implemented by hospitals, ambulance services or health authorities".

The Police Service has overall responsibility for managing major incidents and for coordinating the activities of all the emergency and other services present. The Gold-Silver-Bronze command structure will apply.

'Police-led' and 'HA-led' Incidents

The police will retain the lead in all incidents requiring the powers and skills of a Constable and falling within the general responsibilities of the police. These are known as 'Police-led' incidents. The police manage all 'police-led incidents'. The management of the motorway network away from the immediate incident cordon, including traffic affected by it, will normally be the responsibility of the Highways Agency in its role as the network manager irrespective of which organisation leads at the incident scene. The Highways Agency will generally assume the lead in all other incidents on the motorway network and on the All Purpose Trunk Road network (APTR) where the Traffic Officer Service operates. Elsewhere the police will continue to take the lead. These are known as 'HA-led' incidents.

'Police-led' incidents	'HA-led' incidents
<ol style="list-style-type: none"> 1. incidents involving death or injury (including securing evidence and investigation) 2. suspected, alleged or anticipated criminality (including traffic offences) 3. threats to public order and public safety (including hazardous substances) 4. events requiring significant coordination of the emergency response 5. occurrences where unusual or aggravating factors suggest a police presence is desirable 	<ol style="list-style-type: none"> 1. collisions without injury or alleged offences 2. congestion (including that caused by incidents, adverse weather or excess volume of traffic) 3. obstructions (including debris, break downs, abandoned vehicles, pedestrians and animals) 4. stranded road-users 5. the Regional Control Centre will retain its responsibilities and co-ordinate HA-led incidents even where Service Providers, rather than Traffic Officers, are at the scene

An incident will only have one lead organisation at any time, although the lead may be passed between the organisations during the incident management process. The lead organisation co-ordinates and directs the incident response and is ultimately accountable for it for the duration of its lead. The police will assume the lead if the need for police intervention becomes evident.

7.3.3 Other Terminology

There are a number of other terms that may be used in relation to incident management:

Emergency

This is a term that is defined within the Civil Contingencies Act 2004 and should only be used in that context. The term 'emergency' covers any challenges that present a serious threat to; human welfare; the environment; political, administrative or economic welfare, or; the security of the UK. It includes the process of restoring and rebuilding the community in the aftermath of an incident.

Control Room and Network Control Centre

These terms are used for a 24 hours a day, 7 days a week service provided by the Service Providers to ensure they can be contacted immediately when an incident occurs. In some cases, this service can be co-located within the Highways Agency's Regional Control Centre.

7.3.4 Communication Flow

The following table defines incident levels in terms of the required communication flows:

Level	Level Description	CMT Activated	CMT Informed	Emergency Contact Procedure		Impact on Network	HA Resource Needed	Affect on HA Reputation	Media Attention towards the HA	Consider Debrief
				NILO	SOOC					
0	State of National Emergency	✓		✓	✓					✓
1	Cross Regional or National HA Major Incident	✓		✓	✓	Major impact across Regions / Nationally	Whole Agency / Significant reallocation of resources	Loss of Agency credibility	'Front page' National/International TV/Radio	✓
2	Regional HA Major Incident		✓	✓	✓	Significant part of Strategic Road Network in Region	Reallocation of resources from other Regions	Development of Agency affected	Potential use as 'Front page' headline	✓
3	HA Major Incident		✓	✓	✓	Incident and diversion routes	Mutual aid from neighbouring Regions	Reputation materially affected	National Coverage	✓
4	Serious Incident			✓	✓	Incident and immediate vicinity	Resource covered by overtime	National reputation may be affected	Of interest to National Media	✓
5	Significant Incident					Incident	Local shift resource	Loss of local goodwill	Of interest to Local Media only	
6	Routine Incident					Minimal	HA Vehicle/ISU on Scene	No affect	No interest to media	

7.4 Information and the Media

Recent years have seen a rapid advance in telecommunication and information technology capabilities. Television channels devoted entirely to news and extended news programmes on other channels are a permanent feature of our everyday lives. The impact made at the scene of a disaster by those engaged in gathering material for the media can be enormous and it is vital to prepare for the influx of media representatives - local, national and international. The events of 9/11 in New York clearly emphasize this aspect. In such a major incident, long-term arrangements will need to be introduced and the responsibility of the Highways Agency to maintain a presence with regard to media outputs and supplying information to the public will be substantial.

7.4.1 Assisting the Media

In the first instance, the task of coping with media pressures usually falls to the Police in their role as co-ordinators of the management of the response at and around the scene of disaster and with their responsibility for criminal investigation (this responsibility may later be handed over to a civilian agency once the initial rescue and investigations are complete). But there are other aspects of a disaster - temporary accommodation for victims and perhaps their relatives and friends, safety of damaged buildings and roads, access, diversions, congestion, and so on - which may well call for a quick reaction by the Highways Agency. Consequently, the Highways Agency needs to be involved in the media response from the outset.

7.4.2 Initial Actions

Reporters, researchers, photographers and camera crews will arrive very quickly and can quickly reserve all available accommodation in the area. They will often have learnt of the disaster at the same time as the emergency services and so will take the facilities they require. They will also expect an instant response to their requests for information and briefing. Demands from local and regional media will quickly be augmented by demands from national and - depending on the nature of the disaster - international media. If these demands are not anticipated, media representatives are likely to add to the confusion. Each type of news outlet will also have its own deadline. Television and radio stations may be broadcasting live from the scene into 24-hour news programmes.

Experience has shown the value of immediately dealing with the following points:

7.4.3 Control of Access to the Disaster Site

This is a police responsibility, put in place whenever practical, and intended to allow rescue services to carry out their work unhindered and to preserve evidence at what may be the scene of a crime. It has to be anticipated that the broadcasting media in particular will bring large communications vehicles to the scene. There are clear implications for the Highways Agency, as its road system, even if not directly involved in the incident, is likely to be an important factor in facilitating access. In addition, media helicopters are often deployed and control of the airspace is an early consideration. This may well result in a 'black out' for all mobile phones, except those cleared for use in the emergency. Access arrangements for the media are normally arranged in conjunction with the police. The media will want film/photographs of the disaster scene and will try out every possible access point to achieve this. It is therefore better to offer one specific filming area to ensure safety. If space is limited, access can be offered on a pooled basis, as part of which a small number of photographers/journalists are allowed in, on the understanding that they share their footage with their colleagues. This is common practice where there are valid reasons for doing so.

7.4.4 Establishing a Media Liaison Point

This is a designated point at the disaster scene, preferably outside the outer cordon, for the reception of media personnel, checks on their bona fides and briefing on arrangements for reporting, filming and photography. It may be little more than a rendezvous point with further facilities provided at a media centre. The police will normally designate this point.

7.4.5 Nominating a Media Liaison Officer

The swift attendance at the scene of a professional press officer from the Highways Agency should ease the pressure from the media. This should be done in partnership with other public service press officers from organisations such as the police to ensure consistency. Failure to arrange this will prompt reporters to approach anybody available, which could lend credibility to inaccurate sources. While the press officer takes the onus/responsibility away from those coping with the disaster, brief interviews with senior personnel at the site, as well as with specialists from appropriate Departments/Service Providers will add authority to the information being given.

The media may need to be reminded that in the period immediately following a disaster no one can know precisely what has happened. Initial statements should focus on what is happening, what the limitations of knowledge are at the time and what is being done to arrive at a fuller appreciation of the situation. If such statements are backed by a commitment to provide accurate information as soon as it is available, reporters are more likely to attend briefings and thus accept a measure of control, particularly if these press conferences are scheduled at regular intervals and the times agreed for these are honoured. It is better to keep regular contact with the media even if there is little new to add to ensure good relations and to avoid suspicions that they are being kept in the dark. Reporters are initially avid for facts even of the most basic kind – such as when was the road built, how wide was it, etc. While they are in competition with each other, nonetheless a high concern for reporters is not missing out on anything, especially from an official source, that all the others have, that will lead to irritation from their news desk. Structured arrangements for regular and authoritative briefings, which they can trust, therefore has benefits for both sides. Briefings should be attended by relevant senior personnel from the main organisations involved in the incident, offer up-to-date information and be followed by the chance for one-to-one interviews on camera/tape.

Media coverage of a disaster scenario comes in three phases, often in quick succession, known as the 3 Ms rule – Mayhem (the initial aftermath of the incident establishing what has happened); Mastermind (looking for experts, retired professionals, academics, etc, to provide insights, case histories, etc) and Manhunt (who was responsible; where does the blame lie?). The Highways Agency may well get called on for answers during all three stages.

The media will welcome any factual statements, particularly from eyewitnesses. However, such statements should not include speculation on the cause of the disaster, nor premature or uncorroborated estimates of the numbers of casualties. Highways Agency staff should not get drawn into speculation of any kind.

Care should be taken that information about casualties is not released. Only the Coroner, or police, may authorise the release of information about individuals. Limitations on the release of information, often because of a need to avoid prejudicing what may become a criminal prosecution, should be clearly and frankly explained.

The preparation and maintenance of up-to-date information on the role and responsibility of the Highways Agency can be issued to the media as general background. (Comms Group is currently preparing and updating material which can be used for this purpose in written, video and CD format.)

In the event of a terrorist attack the initial actions just described may be no more than holding arrangements. As the situation develops the need for a comprehensive media response organisation may become apparent. A person who equates to a Public Relations Manager, who may be appointed by the police, should head the organisation.

It is essential for a senior member of the Comms Team – either the Director of Communications, Senior Press Officer or the relevant Regional Communications Manager to be fully involved in the senior management arrangements for the disaster, for example by attending Strategic Co-ordination Group meetings alongside the Highways Agency Divisional Director/Area Performance Manager, so that he or she is fully in the picture and can plan the media response and give advice.

7.4.6 Media Centre

A disaster may also justify the establishment of a media centre to provide working accommodation for media personnel, a news conference and briefing area, facilities for monitoring television, radio and newspapers and a press office with communications equipment. The media centre may be set up by the police or by the local authority or, in collaboration with the police, the Highways Agency may be asked to assist.

Experience has shown that arrangements for a media centre to cope with the demands of the media are extensive. The difficulties of setting up a media centre should not be underestimated and plans should be comprehensive yet flexible.

7.4.7 Highways Agency response to a disaster and staffing a media centre

Due to the nature of the Highways Agency's network, disaster incidents may occur at any time of day or night all over the country and possibly many miles from a Highways Agency office. Because of the nature of the media response as outlined above it is essential that the Highways Agency be prepared to respond equally quickly.

The Highways Agency's Communications Group is the key player in the event of a major incident on the Network. The Group employs a Central Media Unit with staff in London, Bedford and Dorking, which is best suited to take on the central co-ordination role as well as attend an incident, and four Regional Communication Managers who act as a focal point in the regions. In the event of a major disaster, Comms Group may call on the services of the Government News Network (GNN, part of the Cabinet Office - formerly the Central Office of Information), which already provides a regional press service to the Highways Agency. GNN is funded by the Home Office to provide a full press and PR service to Government Departments and agencies following a disaster for up to 48 hours at no cost. Thereafter the "home" department usually pays their charges if a continued presence is necessary. GNN has around 12 press officers based in each GO region used to dealing with the local media and available to man shifts 24 hours a day. Once Area Performance Managers have been notified of a major incident they must contact the Central Media Unit who assess the likely media response and ask GNN to attend.

The Central Media Team runs a duty press officer service 24 hours a day, 7 days a week. The contact details are available from the Area Performance Manager. Service Providers or Area Performance Managers are already tasked with contacting the duty press officer in the event of a major incident.

7.4.8 VIP Visitors

In the aftermath of a major disaster, it is common for the Prime Minister or other Government Minister or a member of the Royal Family to visit the scene. The former will require briefing in advance prepared on what is known about the incident so far and as well as any appropriate

background. Press conferences need to be built in to the timetable for the visit as well as photocalls at the site. Visits by the Royal Family will be co-ordinated by the Lord Lieutenant's Office. The police will assess security before any visit takes place. The press office may be represented during planning meetings for any visits. GNN may well be called in by the home Department or Buckingham Palace to handle the visit on their behalf.

7.5 Communications, Command & Control, Coordination

7.5.1 Introduction

Central to incident management is the system of operational decision-making and control. It is essential that common terms and structures are used and that these terms and structures fit normal working practices and reinforce recognised methods. In this context:

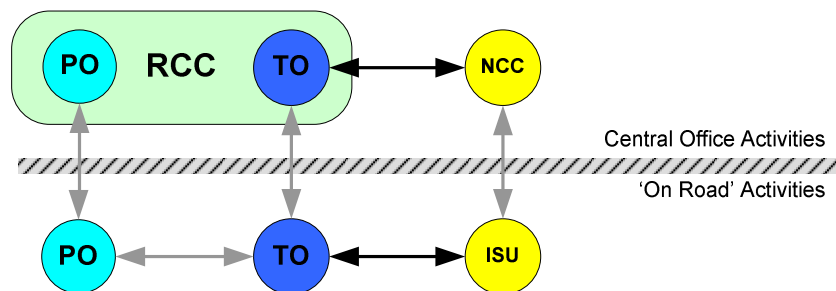
- Communication means the transfer of information together with the methods, protocols and systems used for the transfer of that information.
- Command means the authority for an agency to direct the actions of its own resources (both personnel and equipment).
- Control means the authority to direct strategic and tactical operations in order to complete the assigned function and includes the ability to direct the activities of other agencies engaged in the completion of that function. The control of an assigned function also carries with it a responsibility for the health and safety of those involved.
- Coordination means the harmonious integration of the expertise of all the agencies, both internally and externally, with the objective of effectively and efficiently bringing the incident to a successful resolution.

7.5.2 Communications

It is imperative that clear lines of communications are in place when major and critical incidents occur on the Highways Agency's network. This enables the Highways Agency to provide essential information to drivers about the state of the network and particular roads in a timely manner, minimising disruption and supporting the safety of the travelling public. It also enables the Highways Agency to communicate to senior management and, if necessary, to Ministers. This ensures early notice of potential major incidents to staff delegated to undertake Highways Agency Gold Command and Crisis Management Team.

The RCCs are the Highways Agency's regional hub for communication between people and organisations involved in planned and unplanned events, such as incidents and emergencies. The RCC will advise the Service Providers as to whether an incident is 'Police led' or 'HA led'. An incident will only have one lead organisation at any time, although the lead may be passed between the organisations during the incident management process. The lead organisation coordinates and directs the incident response and is accountable for this function for the duration of its lead.

The guiding principles for communications on- and off-activities are illustrated in the diagram below.



At 'Police led' incidents the Highways Agency and its Service Providers will support the Police as necessary. The central communication point for the Police is at the RCC or if required for a particular incident, usually civil emergency, at the Police Control Office (PCO). Systems are in place to facilitate communications between PCOs and RCCs. For 'HA led' incidents the Highways Agency is the lead responder and its communication centre, both internally and externally, with the Service Providers is the RCC. The RCC shall in general communicate directly with the Service Providers' control room. For both 'Police led' and 'HA led' incidents the Service Providers must provide information relating to the incident directly to the RCC and/or PCO.

Service Providers must report to the Incident Commander (Police, TOS or Fire Service) on arrival at and departure from an incident scene. The HA's and the Service Provider's Incident Commanders will wear a tabard identifying them as such. The Traffic Officer Service, either through the RCC or Traffic Officers at the scene, will identify the required outcome and relevant priorities. If the incident is 'Police led' and Traffic Officers are not in attendance, the Police may highlight urgent work required. The Service Providers will discuss options with the Incident Commander and is responsible for implementing the preferred option agreed with the Incident Commander. Service Providers in consultation with Area Performance Teams will determine and implement the work necessary to achieve the requested outcome. Individual organisations remain responsible for the command and control of their resources at the scene of an incident.

Service Providers must also provide information directly to the NTCC and NILO. Service Providers must not talk directly to the media, the Highways Agency's Press Office or the Government News Network, unless there is a local agreement in place which says otherwise. The Police and/or Highways Agency/GNN will manage any media, including camera crews and reporters, attending an incident. Highways Agency Press Officers have been assigned to RCCs.

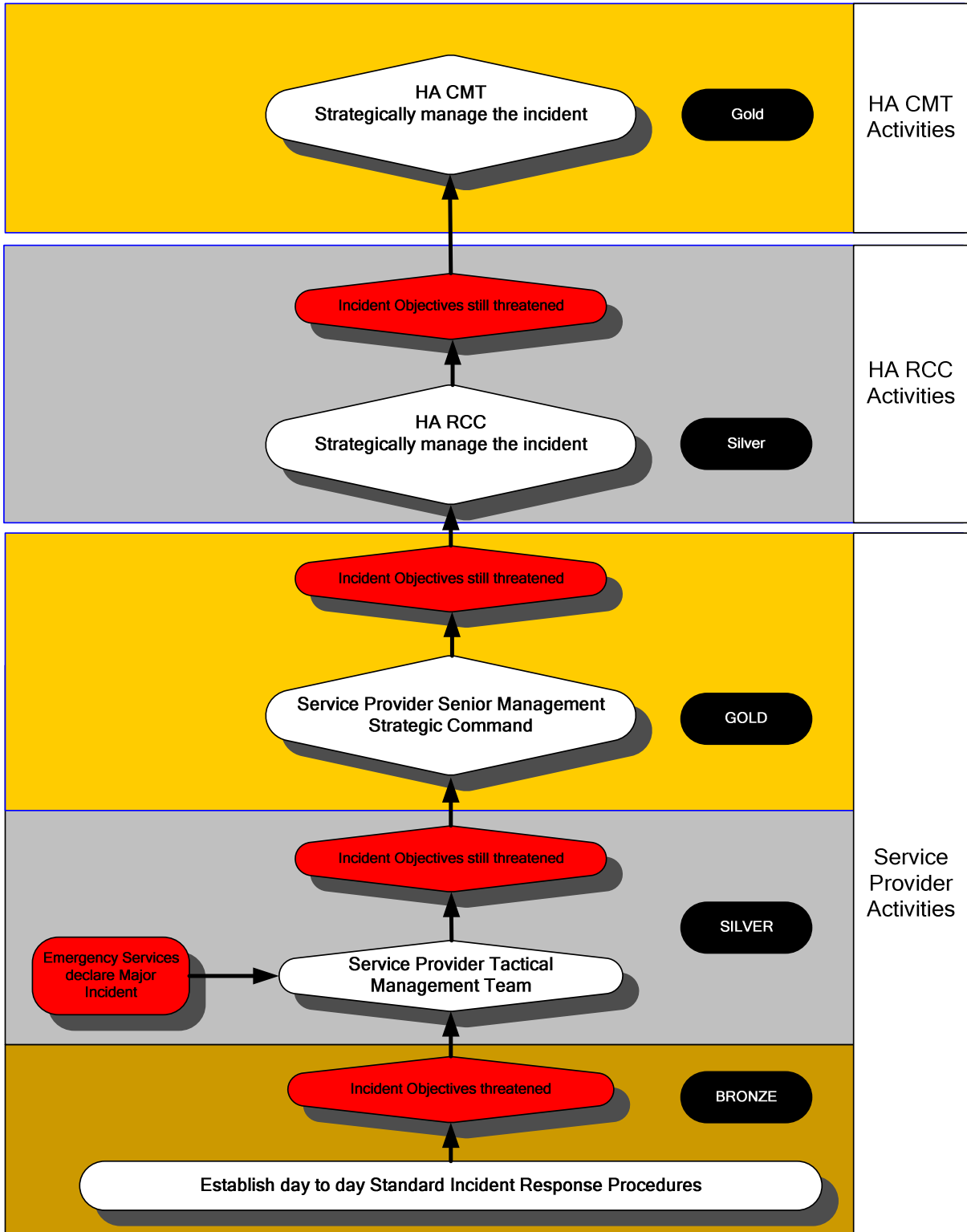
7.5.3 Communication Methods and Protocols

Communication methods will range from dialogue between individuals through written communications, fax and land line telephone to radio systems, including the dedicated Airwave radio channel. The appropriate method of communication will vary according to availability and circumstances. Protocols are established for all internal Highways Agency and Service Provider functions for incident management. The protocols, covering both methods and channels of communication, are set out in relevant documentation, including Highways Agency Traffic Officer Service and Service Providers Joint Operating Principles Annex B, the Service Provider's contract and/or instructions. While the Highways Agency is seeking to develop uniform arrangements as far as possible, the detail of communication methods will vary across Areas and Regions.

It is essential that robust communication arrangements are in place. This can be as simple as recording both mobile and land-line telephone contact numbers, or may be more complex, such as the need to cope with 'radio black-spots' or areas with no mobile phone coverage. It is essential for Highways Agency and Service Provider personnel to be familiar with the current situation in their own Areas and Regions. These issues must be dealt with in Area and Regional contingency plans.

7.5.4 Command and Control

Figure 0.1: High Level overview of escalation procedure



Command means the authority for an agency to direct the actions of its own resources (both personnel and equipment). Effective command requires the provision of administration and support functions to extend the thinking of the Commander. It also requires a regime, a disciplined organisation of people and systems in which the function holders are empowered to execute strategy and deploy resources.

The exercise of command is always situational. Command is, however, not merely a mechanical response. The Highways Agency's Standard Incident Management Framework (SIMF) places the Incident Commander in a position to exercise control but command at any level also involves leadership and perspective. Incident Commander must balance competing demands in a complex environment and because of these complexities and their accountability; they will find it advantageous to operate according to a set of command principles.

The management of the response is divided into three levels - Operational, Tactical and Strategic. The requirement to implement one or more of these management levels will be very dependent on the nature of the incident, but normally incidents will be handled at the Operational level, only moving on to the Tactical and finally the Strategic level should this prove necessary.

Service Providers must complete their contingency plans, which details how the Service Provider must escalate an emergency response from Operational (Bronze) to Tactical (Silver) and Strategic (Gold) levels, on occasions when that is needed. The contingency plan is designed to ensure that Service Providers, together with the Traffic Officer Service and Area Performance Teams, are able to make a proper response to the situation in order to support the actions and requests of the emergency services, ensure that proper interfaces are achieved with other organisations, and ensure that nuisance to the Highways Agency's customers and major stakeholders are minimised.

Operational Level - BRONZE

On arrival at the scene of an event, the emergency services will take appropriate immediate measures and assess the extent of the problem, under the command of their respective Incident Officers. They will concentrate on their specific tasks within their areas of responsibility and act on delegated responsibility from their parent organisations until other levels of command are established.

All this takes place at the Operational level and is the normal day-to-day arrangement for responding to any incident. The command of the resources belonging to any agency and applied within a geographical area, or used for a specific purpose, will be retained by that agency. The Highways Agency and its Service Providers must liaise fully and continually with others employed within the same area to ensure an efficient and combined effort. The police will normally act as the co-ordinator of this response at the scene.

These arrangements will usually be adequate for the effective resolution of most incidents. However, for more serious incidents - requiring significantly greater resources - it may be necessary to implement an additional level of management.

Tactical Level – SILVER

A Tactical level of management is introduced in order to determine priority in allocating resources, to plan and co-ordinate when a task will be undertaken, and to obtain other resources as required.

Most, but not all, of the Tactical functions will be discharged at or close to the scene of the incident. Some agencies, particularly local authorities, will prefer to operate from their administrative offices but will normally send a liaison officer to the scene to liaise with the Incident Officer(s). Planning must also take into account that there may be a number of individual scenes.

When more than one agency is operating at the Tactical level there must be consultation between the various agency Incident Officers. The Tactical Commanders are not required to become involved with the activities at the scene being discharged by Incident Officers, but concentrate on the overall general management. In order to effect co-ordination, an inter-agency meeting should be held at regular intervals attended by each Tactical Commander and normally chaired by the police.

If it becomes apparent that resources, or expertise beyond the level of the Tactical Commander are required, or should there be the need to co-ordinate more than one incident/scene (where tactical command has been established), it may be necessary to implement a Strategic level of management.

Strategic Level – GOLD

NEED TO SEPARATE GOLD FROM SCG AND NCMP

Gold (Strategic Management by the HA RCC)

Strategic management of the incident passes to the RCC. Details of how they operate can be found in the RCC Contingency Plan and the wider actions to be taken within the HA at this level are set out in HA's Standard Incident Management Framework Document (SIMF)

Gold (Strategic Management at a national level by HA's National Crisis Management Team (CMT))

Strategic management of the incident passes to the CMT. Details of how it operates can be found in the National Crisis Management Plan

The purpose of the Strategic level of management is to establish a framework of policy within which Tactical Commanders will work, to give support to the Tactical Commander(s) by the provision of resources, to give consideration to the prioritisation of demands from any number of Incident Officers and to determine plans for the return to a state of normality once the incident is brought under control. The requirement for strategic management may be confined to one particular agency. However, certain incidents require a multi-agency response at the Strategic level in order to effect resolution. In such incidents a Strategic Co-ordinating Group must be formed.

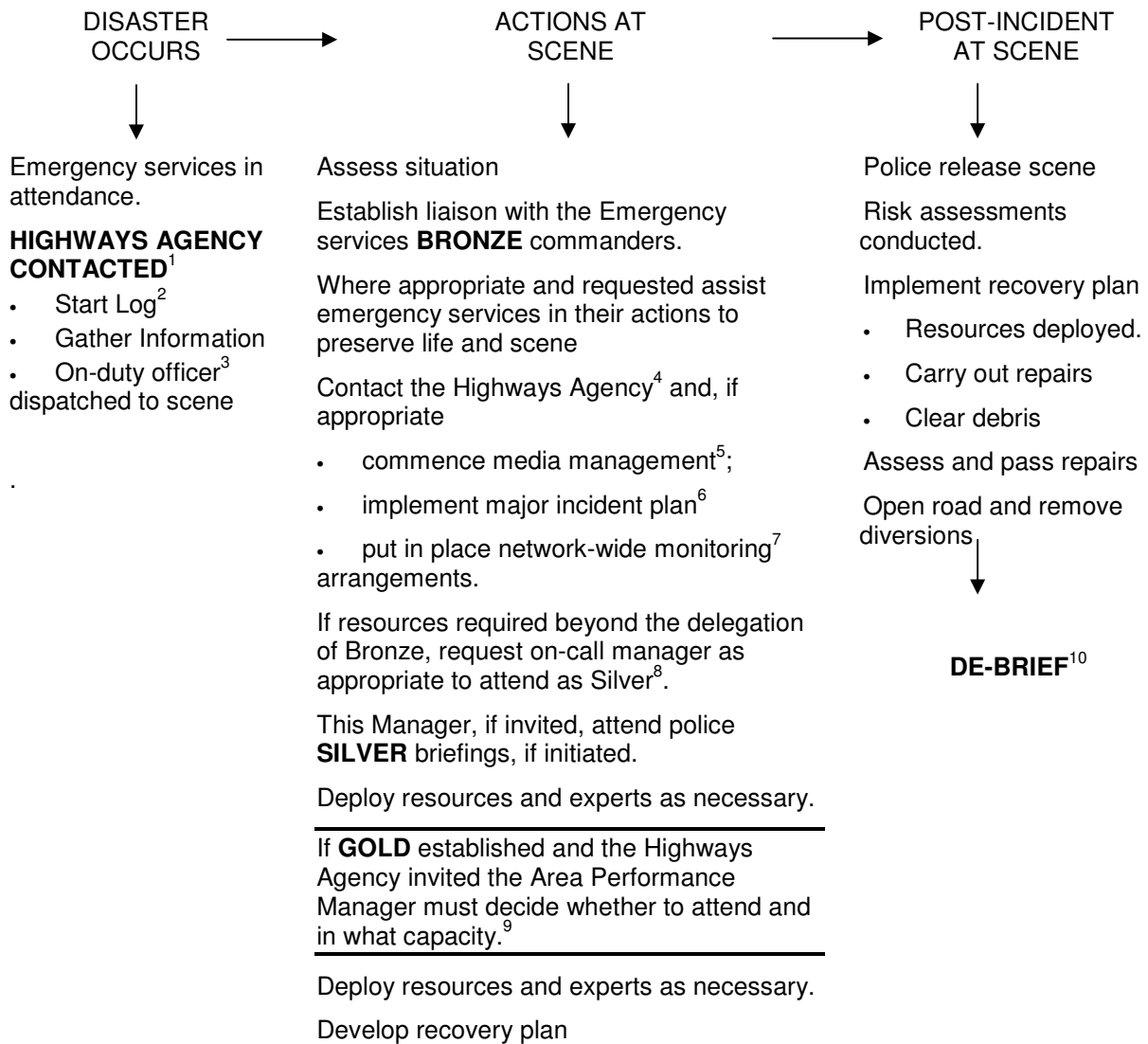
It will normally be a police responsibility to establish and chair the Strategic Co-ordinating Group (SCG). However, due to the nature of some major incidents other agencies may wish to initiate its formation and chair the group. Chairmanship may at some stage be passed to another agency (e.g. from the police to the local authority to manage the recovery phase). The Strategic Coordinating Group is normally made up from a nominated senior member from each statutory agency involved with the response. Those persons attending must be able to make executive decisions in respect of resources within their organisation and have the authority to seek the aid of other organisations in support of their role. The Strategic Coordinating Group provides the focus for communication to and from the Lead Government Department. In extreme circumstances, such as a terrorist incident, it may be necessary for the police to take executive action in respect of the total incident.

The SCG should be aware of its wider role which may encompass central government interests, handling requests for advice and assistance from individual services and agencies, and media demands. In the event of widespread disaster the SCG will need to liaise with similar neighbouring SCGs and, during the recovery phase, with the appropriate Regional Government Office.

The Strategic Co-ordinating Group should develop a strategy for dealing with the media, designate a media briefing centre and appoint a media-briefing centre manager (normally a police press officer).

The Strategic Co-ordinating Group should be based at an appropriate pre-planned location, away from the noise and confusion of the scene. It is usual to locate the Strategic Co-ordination Group at Police Headquarters, but this may move to the local authority during the incident.

The Response of the Highways Agency



Notes:

1) Probably the Service Provider's network control centre.

2) From the outset all those involved in the incident must maintain a log of all decisions and advice given. If necessary request emergency personnel endorse the log, especially if contrary advice is given to the action subsequently taken.

3) It has been assumed that the on-duty officer would initially be from the Service Provider as part of the rapid response team or similar. This person would represent the Highways Agency at an operational level i.e. Bronze.

4) The Public Relations Duty Officer and, if appropriate, the Highways Agency's Area Performance Team.

- 5) Please see Chapter 7.4.
- 6) Please see Chapter 7.6 on contingency planning.
- 7) For major incidents that are not isolated to a single area or region a network-wide co-ordination point (as undertaken for the fuel crisis and the fire fighters' strike) is sometimes required to ensure a consistent response and collate briefing for the Highways Agency Board and Ministers.
- 8) The manager must be able to mobilise the full resources of the Service Provider, including specialists, such as bridge engineers etc, to assess damage and formulate recovery plans. The following is a list of services that might be required:
- Act as an advisor to other agencies within the Highways Agency's realm of expertise.
 - Assess and mitigate/control risks.
 - Implement road closures/ diversions in consultation with other agencies.
 - Implement procedures for protection/salvage of Highways Agency property (bear in mind need for evidence storage for criminal investigations).
 - Ensure continuity of staff and resources
- 9) If a more strategic command is required, the police may initiate Gold command and request the attendance of the Highways Agency. The Highways Agency's representative at Gold will be expected to have the authority to command the resources of the Highways Agency and should, therefore, be an employee of the Highways Agency and, preferably, the Area Performance Manager. In deciding whether to attend, the Area Performance Manager must consider and discuss the issue with his Group Manager/ Divisional Director:
- What contribution the Highways Agency can make to Gold;
 - Whether it is necessary to attend in person or whether telephone contact is appropriate;
 - That there may be more than one Gold established in his Area;
 - How the Highways Agency will ensure continuity of staff (Gold could be established for a number of days).
- 10) Within a reasonable period of the incident the Area Performance Team together with the Service Provider must hold a debrief meeting to review the management of incidents in the future. A copy of the note must be sent to the Operational Support Team such that learning points can be distributed more widely.
- 11) Change Major Incident Plan as necessary.

7.6 Contingency Planning

7.6.1 Contingency Planning – The Principles

Contingency planning embraces a number of concepts, some of which overlap. These are:

- That the principal emphasis in the development of any plan must be on the response to the incident and not the cause of the incident. Planning arrangements for a range of emergencies, whether caused naturally, resulting from technical failure, or by a deliberate act of terrorism, must be integrated. The plan has to be flexible; it has to work on a bank holiday weekend, or in freezing weather conditions and at any location. It will need to be tested against specific scenarios.
- The emergency management arrangements need to be integrated into the Highways Agency's everyday working structure and it is therefore essential for those who will be required to respond to any emergency to be involved in the planning process and subsequent exercises.
- The overall response to a crisis will invariably need input from Highways Agency and the whole supply chain. Effective planning must integrate all contributions and establish protocols in order to achieve an efficient and timely response to an incident. Being unaware of the contribution that others will need to make is a recipe for a muddled response.
- There is a vital need to co-ordinate arrangements with other authorities and organisations. The effects of a major incident, or terrorist attack will almost always span boundaries, and indeed may spread. If the response is to be truly effective in meeting the needs of everyone caught up in the disaster then those involved have to be aware of the roles they may be called upon to play and how they fit into the response as a whole.

The main planning stages associated with any emergency plan are usually as follows; further details are contained in the Highways Agency's Contingency Planning Framework:

- Assessment/ Intelligence – quantify the hazards and potential targets and manage the risk;
- Prevention – measures that seek to prevent emergencies occurring;
- Preparedness – plans that enable an organisation to respond to known hazards as well as unforeseen events;
- Response – the initial response to an incident; and
- Recovery – the return to normality.

7.6.2 Contingency Planning – How to Prepare a Plan

Area Performance Teams are responsible for ensuring that the Service Provider develops contingency plans that must include preventing, responding to and recovering from major incidents. The RCCs Network Operations Manager is part of an Area Performance Team and must therefore directly be involved in developing contingency plans.

To develop an effective plan that will ensure a co-ordinated response should a major incident occur, the assistance of the Highways Agency, its supply chain and external organisations will have to be engaged.

Assessment / Intelligence

TO Directors must, from time to time and based on intelligence from the Security Services, review the threats facing the Network and agree a plan to manage them. This plan must be cascaded through TO to Area Performance Teams.

Area Performance Teams must then review their potential targets to these threats. This assessment needs to recognise that the Network may well be effected not only by structures/locations specifically on the road system, but also by locations adjacent, or due to its strategic importance to an incident which may have taken place some distance away, e.g. route for emergency vehicles, evacuation route, etc.

Actions could include:

- Review areas of responsibility, to identify potential targets/vulnerable locations, both on the Network and adjacent
- Identify other features e.g. design that may increase loss/disruption
- Consider the area, through which their network runs (for example is the Network adjacent to a nuclear power station?) and evaluate the potential for the road system to be disrupted by a major incident
- Work through foreseeable scenarios to aid risk identification. This will allow speedy restoration of the system
- Act upon advice issued by the Highways Agency in respect of threat assessments

In prioritising these targets, the use of the following criteria is recommended:

- If loss of the target would significantly affect a major city;
- If the target is, or might appear to be, a particularly vulnerable structure;
- If the target is a structures with a significant publicity value;
- If the structure over-spans or runs alongside an installation or facility which might be considered a target and the structure could provide a path for using a vehicle as an explosive device or to trigger an explosion by impact.

Prevention

Measures need to be adopted following the assessment of the likely hazards, which seek to prevent emergencies occurring, or to reduce their severity. These measures have the following objectives:

- Deter (terrorist) action at this location by reducing the (apparent) vulnerability through protection such as barriers or by increasing the likelihood of the perpetrators being caught through, for example, better lighting or the use of CCTV.
- Reduce the effectiveness of any action against the target by increasing the distance from the device to the target through improved fencing.

Actions might include:

- Raise awareness of threats within their area.
- Increase inspection levels at vulnerable sites, especially at times of heightened threat.
- Develop a pragmatic and affordable programme of activity to reduce the vulnerability of targets.

Preparedness

Plans need to be prepared to enable the Highways Agency to respond to known hazards as well as to unforeseen events. Their needs to be clear ownership of the plans, and their effectiveness needs to be tested in regular exercises and the lessons learned incorporated back into the plans.

The Highways Agency must be involved in Local and Regional Resilience Forums, as required by the Civil Contingencies Act 2004, Emergency Planning Groups that usually include the police, emergency services, local authorities, hospitals etc, such that there is:

- clarity of responsibility and roles of all parties;
- clear lines of communication;
- clear understanding of targets;
- established contingency plans; and
- involvement by the Highways Agency in appropriate exercises.

Actions might include:

- Identification of BRONZE, SILVER and GOLD roles as in the Highways Agency's contingency plans, key personnel (including media representatives and technical specialists) and robust 24/7 communication channels.
- Ensure staff in relevant posts receive training for the nature of responsibility they may be called upon to discharge, in the event of a major incident.
- Ensure maintenance and inspection records are up to date and available as these may be vital to allow Highways Agency representatives to give informed advice.
- Ensure a suitable media representative has been selected.
- Ensure that there is resilience in the numbers of personnel trained to provide for a long running incident; say of two weeks in duration.
- Test the local liaison arrangements with the emergency services. Recognise there may be different combinations of Authorities within a Highways Agency Area.
- Organise tabletop exercises to test plans and involve the actual players.

Response

The initial response to an incident is normally provided by the statutory emergency services, the Highways Agency Traffic Officer Service and, as necessary, by the appropriate local authorities and possibly voluntary organisations.

The Highways Agency might be expected to:

- Implement strategic or local diversion routes;
- Provide reasonable support to the emergency services (in terms of equipment/ personnel) to provide the initial response;
- Provide information on the Highways Agency website and to HAIL;
- Provide information and briefing to the Highways Agency Board and Ministers.

Planning actions might include:

- With the police and local highway authorities identify and agree diversion routes;
- Ensure the emergency services, especially the police, have details of how the Highways Agency can be contacted;
- Identify what equipment/ services are available (and how to obtain them) in the event of a major incident.

Recovery (restoring the Network to normality)

This phase will encompass those activities necessary to provide a rapid return to normality of the Network. Planning actions might include:

- The production of generic recovery plans based on the types of target and the hazards faced.
- Identify what equipment/ services would be required and how they could be obtained.

7.6.3 Emergency Planning Exercises

The Highways Agency, as the Network operator, must be involved in emergency planning exercises that occur on or affect our network.

Every effort should however be made to minimise any affect on users resulting from and costs of the exercise.

Exercises can be arranged to test internal procedures or involve the Highways Agency as one of a number of organisations. As such, they can be 'desk-top' or 'mock' situations involving actors either on the Network or other suitable locations (such as disused airfields).

To play or not to play?

There are two separate roles in emergency planning exercises, that of the exercise planner and the exercise player.

When first approached to take part in an exercise, careful thought at Group Manager/ Divisional Director level is required to decide what role the Highways Agency should play. The Network Resilience Team Bristol can provide advice concerning a proposal and must be informed of all requests.

Emergency planning exercises are resource intensive, often requiring months of planning with the exercise occurring sometimes over a 24 or 48-hour period.

The role of the planner is to ensure that the scenario is, and remains during the exercise, realistic and to keep the detail of the exercise separate from the players. This role will require the development of the scenario, an assessment of the impact and any secondary impacts, the provision of injects into the exercise and response to players during the exercise.

The role of the player is to take part in the exercise, testing communication paths and procedures.

The decision to play should be taken very early such that roles of the planner and player can be separated. If the Highways Agency just plans, then the responsibility for planning lies with the Operations Team in which the incident is proposed. If it both plans and plays, then the roles could be given to separate teams within the same region.

Post Exercise

A thorough debrief must take place after the exercise to establish learning points. These should be considered when adjusting contingency plans. A copy of these learning points must be sent to the Network Resilience Team Bristol, such that good practice can be applied across the Network. It is the responsibility for the Highways Agency to ensure that this process is undertaken.

The contingency plan must be designed to ensure that:

- Members of the Service Providers are in the right place at the right time.
- They are aware of their individual responsibilities, decisions and actions they have to take.
- They have the information and resources necessary to make these decisions and undertake these actions in a timely and efficient way.

The RCC contingency plan involves a mobilisation of the RCC, Area Performance Teams and Service Providers in sufficient numbers to enable any level of network disruption to be dealt with. Figure 7.6.2 below provides a high level overview of the escalation procedure.

7.6.4 Off-Network Tactical Diversion Routes

Service Providers are required to familiarise themselves with the National Guidance Framework for Operational Activities (LHA NGF) between Local Highway Authorities and the Highways Agency and the Detailed Local Operational Arrangements, in order to identify, establish and maintain tactical diversion routes.

Tactical Diversion Routes are those routes used to divert traffic off the Highways Agency's network onto LHA roads to assist incident management. These routes need to be established as part of contingency planning arrangements

Service Provider Responsibilities

Service Providers are responsible for:

- providing the Area Performance Manager and annually reviewing:
 - (i) details of each link on the Area network indicating the current status of tactical diversion routes and
 - (ii) a costed programme

- until all tactical diversion routes for the Area have been established, to deliver wherever possible, a complete network of Class I tactical diversion routes for the Area as described in Chapter 7.6.4
- identifying and arranging the establishment and subsequent maintenance of tactical diversion routes in close partnership with those LHA Traffic Managers whose authority's roads connect with the Highways Agency's network in their Area
- liaising with the freight transport industry (where available through the 'Freight Quality Partnership') to ensure the industry has opportunity to contribute to the planning of tactical diversion routes
- liaising with the Police and Traffic Officer services to ensure tactical diversion routes and associated operational arrangements agreed with the LHA are understood and supported by the Police and Traffic Officer services
- producing the Map/Route Card and other documentation for each tactical diversion route when agreement has been reached with the LHA for each tactical diversion route
- managing the provision and controlled distribution of hard and electronic copies of Map/Route Cards and other documentation when the infrastructure for each route has been established, to be held in a document referred to as the 'Tactical Diversion Routes File'
- liaising with the LHA as required prior to a decision to use a tactical diversion route (where a decision is possible) for those parts of the Network where there is no operational Traffic Officer service, subject to agreed local operating procedures
- carrying out winter service operations on a tactical diversion route, when necessary, in accordance with arrangements agreed with the LHA and operational procedures, prior to the implementation of a tactical diversion and
- attending a review meeting arranged by the LHA, normally within 2 weeks of receiving a notification that the LHA has identified:
 - (i) a required or proposed change to, or
 - (ii) operational issues which require review (but do not require a formal 'incident debrief') of an agreed tactical diversion route.

Responsibilities of Other Stakeholders

Within their operational areas the Traffic Officer service is responsible for traffic incident management, including the decision to use tactical diversion routes (where a decision is possible).

The Traffic Officer service is also responsible for making alternative arrangements to relieve congestion on the Network when a tactical diversion route is not available. They will be familiar with the information in the contingency plan for alternative diversion and, emergency access/egress opportunities, rearward relief and turn-around arrangements. Activation of welfare arrangements by notification to the appropriate party (normally the LA) will only be considered as a last resort.

The Highways Agency has agreed (in the LHA NGF) that, if possible, the Highways Agency or their representative will liaise with the LHA as required prior to a decision to use a tactical diversion route. Where the tactical diversion route is outside the Traffic Officer service operational area, it will be the responsibility of Police to implement a tactical diversion route.

To provide a consistent approach to tactical diversion onto LHA roads the Highways Agency will seek to encourage Police, both nationally and locally, to use agreed tactical diversion routes wherever possible when dealing with traffic management.

The NTCC is responsible for identification and operational implementation of strategic diversion routes.

The Highways Agency's liaison team (based at the NTCC) will be responsible for:

- (i) updating LHA DLOAs in line with revisions;
- (ii) including tactical diversion routes within their annual DLOA review meeting with each LHA;
- (iii) informing the Area Performance Team and/or Service Provider (as appropriate) of any issues identified and
- (iv) providing notes of the meeting to the Area Performance Team and Service Provider.

The Network Resilience Team is responsible for ensuring that up-to-date versions of all contingency plans, which include details of tactical diversion routes, are available on the Highways Agency Portal.

LHAs are responsible for the management of traffic on their network, irrespective of the reasons for it being there.

LHAs are requested to attend a review meeting arranged by the Highways Agency normally within 2 weeks of receiving a notification that the Service Provider has identified:

- (i) a required or proposed change to or
- (ii) operational issues which require review but do not require a formal 'incident debrief' of an agreed tactical diversion route.

The Police are responsible for managing:

- (i) 'Police-led' incidents on the Highways Agency's network where the Traffic Officer service is operating;
- (ii) all incidents on the Highways Agency's network outside the Traffic Officer service operational area; and
- (iii) all incidents on LHA networks.

Classification of Tactical Diversion Routes

Classes of tactical diversion routes are as follows:

Class 1

A route agreed as a suitable tactical diversion route under the arrangements set out in Chapter 9.3.5.4 by co-operation of LHA, Traffic Officer service and the Police and is permanently signed.

Class II

A route is accepted by all parties as a possible tactical diversion route, but is not signed, and may not be formally accepted by the LHA.

Class IIIa

A route is identified as a potential tactical diversion route but is acknowledged to be inadequate at certain times for diversion of traffic off the Highways Agency's network and there is no alternative superior tactical diversion route option.

Class IIIb

A route is identified as a potential tactical diversion route but is acknowledged to be inadequate for diversion of traffic off the Highways Agency's network due to physical constraints and there is no alternative superior tactical diversion route option.

Arrangements for Identifying, Establishing and Maintaining Tactical Diversion Routes

Identification

In close liaison with the LHA Traffic Manager, Service Providers must identify tactical diversion routes for the Area network for which they are responsible in co-operation with LHAs and other stakeholders.

The identification is based on a risk assessment (a framework for tactical diversion route risk assessment is set out in 9.3.5.6) to assess suitability of any potential route for the tactical diversion of traffic off the Highways Agency's network. A record of risk assessment is retained by the Service Provider.

Where not possible to identify a suitable tactical diversion route, a record of the assessments carried out in seeking to identify a suitable tactical diversion route must be retained by the Service Provider.

Where it is identified a tactical diversion route is suitable only for use by restricted classes of traffic or there is no suitable tactical diversion route available-but infrastructure improvement on the LHA network could enable one to be provided, the Highways Agency will, subject to the agreement of the LHA, identify costs of any improvements required and provide a business case for funding (or joint funding of the work, if appropriate), so the improvement scheme can be considered within any future works programmes.

Where possible and with lack of a primary tactical route, a secondary (alternative) tactical diversion route will be identified. It is recognised that such opportunities will not generally be available.

Establishment

The Service Provider will discuss arrangements with the LHA for establishing a necessary and appropriate signing infrastructure for each tactical diversion route on the LHA's roads.

The LHA will undertake the sign design. Where the LHA has insufficient resources to complete the design in a timely manner, by request of the LHA, the Service Provider may assist with the design of tactical diversion route signing.

Tactical diversion route signing will be designed to incorporate local circumstances, and will:

- (i) include sufficient repeater signs to ensure confidence is maintained for diverted road users throughout their journey and
- (ii) be 'closed out' between the start of the tactical diversion route and subsequent return to the Highways Agency's network.

Sign installation maybe undertaken by the LHA or in co-operation with the Service Provider.

Secondary tactical diversion routes will not be permanently signed unless the LHA and the Highways Agency agree exceptional circumstances make this advisable. However, documentation referred to in Chapter 9.3.5.5 is required for secondary tactical diversion routes.

Maintenance

The LHA will undertake routine inspections of tactical diversion route signing on its roads in accordance with the LHA's normal cyclic maintenance regime for safety and service inspections. A copy of their inspection report should be forwarded to the Service Provider within 28 days of the inspection being carried out.

The LHA will rectify any defects of tactical diversion route signs in accordance with their performance standards for rectification of defects which represent an imminent danger to road users (Category 1 defect).

The Service Provider must carry out an annual inspection of each tactical diversion route and associated signing in its Area.

The Service Provider must ensure the Area Performance Manager is advised of any actions required as a result of inspections or reviews and to take such actions necessary to ensure a robust network of tactical diversion routes continues to be available.

Documentation for Tactical Diversion Routes*Operational and Infrastructure Records and the Tactical Diversion Routes File*

The Service Provider is responsible for producing the following:

The Maps/Route Cards, as described in F1 in this section, for the agreed tactical diversion routes must be held as the '*Tactical Diversion Routes File*'.

Documentation records for each tactical diversion route are needed to meet the following requirements:

- (i) a map-based record showing the tactical diversion route;
- (ii) operational information and
- (iii) a record of signing and other infrastructure for the route.

Document Format and Requirements

Map/Route Cards (F1) show the essential details of the relevant Area network road, the relevant link closure to which the tactical diversion route applies and the tactical diversion route on the LHA network using an OS map base.

Operational information (F2), Sign and Infrastructure information (F3) and Additional information (F4) must be in a format agreed by the partners agreeing and operating the route.

Each record document must include:

- (i) tactical diversion route description;
- (ii) tactical diversion route Identification;
- (iii) the date of issue;
- (iv) the names of the stakeholders agreeing the route; and
- (v) subject to their agreement, the logo of each stakeholder.

Route identification number to be of the format:

Road number / Route Direction followed by its route direction (BD- Bi-Directional, S- Southbound, N- Northbound, E- Eastbound and W- Westbound)/Area number (1-24) / Diversion number (to be a

unique number for the Area, using a suitable system agreed with the Area Performance Manager). A diversion route must be assigned a number similar to 'A1-BD-14-11'.

The information requirements of the documentation are as set out in F1 to F4 below.

F1 Map/Route Card

- The part of the Area's network which is closed;
- the tactical diversion route;
- the road numbers of all relevant Area network roads and the tactical diversion route;
- directional indication as necessary and
- boundaries (if any) between:
 - (i) LHAs;
 - (ii) Area operational boundaries;
 - (iii) Traffic Officer service operational boundaries (if applicable); and
 - (iv) Police service operational boundaries.

F2 Operational Information

- Sufficient detail of junctions both at the Area network/LHA road junction and at junctions on the tactical diversion route to illustrate an exact route to be followed by diverted traffic;
- local names of junctions and any other significant 'landmark' features on the Area network;
- major traffic generators on the tactical diversion route, or likely to affect/be affected by its use;
- for dual carriageways on the Area network, whether the tactical diversion applies to closures of both carriageways or only to one direction;
- whether the tactical diversion route is for use with two-directional traffic (i.e. can be used for diverted traffic in both directions whether both carriageways of the Area network road link are closed, or not);
- whether the tactical diversion route is suitable for all types of vehicle or not;
- special arrangements for tactical diversion or retaining HGVs and any other vehicle class, if applicable;
- if the tactical diversion route cannot be used by diverted traffic in both directions, the directional tactical diversion route information to be used in the event of a closure of both carriageways. Implementation procedures for the tactical diversion route, including responsibilities for each action;
- potential traffic problems that may be encountered with use of the tactical diversion route (e.g. peak-time congestion, regular public events such as sports matches, etc);
- requirements for times when use of the tactical diversion route may be of limited effect (e.g. at peak times) and/or
- special arrangements e.g. for controlling rate of egress from the Area network road at peak times,
- special operating arrangements for the tactical diversion route (e.g. requirements for adjustment to the phasing of traffic signals on the LHA network or for traffic signals under the Highways Agency's control at the junction of the Area and LHA networks, change of signed priority at junctions etc);
- operating arrangements including responsibility for ensuring that traffic diverted onto a tactical diversion route does not run on untreated surfaces in winter conditions;
- responsibilities for changing variable/flap signs and for placing temporary signs and their removal on closedown and
- any requirements for complementary plans for setting VMS for the LHA's (local) and the Highways Agency's (strategic) VMS signs (arrangements to be made through the Highways Agency's (NTCC) regional liaison officer for discussions with NTCC to agree the complementary VMS plans with the LHA).

Contact information

Telephone contact details to be shown for:

- LHA office hours contact,
- LHA out-of-office hours contact
- Traffic Officer service contact;
- Service Provider network control centre,
- Police Control Room;
- significant traffic generators on, or likely to affect/be affected by use of the tactical diversion route.

F3 Sign and Infrastructure Information

- The symbol sign in use applicable to the tactical diversion route;
- the location and information provided on any flap/variable signs;
- the storage location and inventory for temporary signage;
- the locations in which any temporary signage is to be placed;
- the location of any traffic control equipment on the tactical diversion route (e.g. traffic signals);
- the location of any Highways Agency VMS immediately adjacent to the affected Area network road link.
- the location of any LHA VMS on or relevant to the tactical diversion route;

F4 Additional Information

Any information required for effective maintenance and operation of the tactical diversion route, including signage which is not shown in documents prepared for F1 to F3 above, must be recorded in the Tactical Diversion Routes File, such as the following information:

Permanent signing

Sign	Sign location

Temporary signing

Temporary sign schedule	Location of temporary signs	Organisation responsible for positioning temporary signs

Cross-boundary issues

Complete this section if applicable to the route in question for any cross-boundary issues where a tactical diversion route lies partly within the area of the Local Authority concerned and partly within the area of a neighbouring Local Authority

Documentation Records & Distribution

The documentation records must be held by the Service Provider in hard copy and electronically in pdf. format for the duration of their contract and for handover to their successor Service Provider.

A controlled electronic (pdf.) copy of all the documentation for each tactical diversion route must be provided to the:

- LHA Traffic Manager;
- the Local Authority Emergency Planning Officer;
- the Police;
- the Traffic Officer service and
- the Area Performance Manager.

The record of agreement must include those cases where it is acknowledged that no suitable tactical diversion route can be identified.

One collated set of laminated Map/Route Cards for each tactical diversion route must be provided to the LHA and the Police and the Traffic Officer service and new Map/Route Cards are to be issued as they are agreed.

Service Providers must determine their own requirements for distribution of documentation within their own organisations.

Risk Assessment for Tactical Diversion Routes

The following framework is intended as guidance only. It is neither prescriptive nor exhaustive and is suggested for us in determining the risks presented by any potential tactical diversion route.

TACTICAL DIVERSION ROUTES - RISK ASSESSMENT GUIDANCE								
Agency network Route:	-	Agency network Road location requiring diversion:	-	Proposed diversion on LHA road				
Identified Risks								
Risks arising from diversion of traffic onto the proposed diversion route	All classes of road users	Increased traffic volumes	Change in the traffic composition on the diversion route, particularly with regard to increased proportion of HGVs	Other risks?	Other risks?	Other risks?	Other risks?	Other risks?
Risk Assessment								
Risks arising from particular features on the proposed diversion route	Schools	Hospitals	Sports venues	Level crossings	Other risks?	Other risks?	Other risks?	Other risks?
Risk Assessment								
Risks arising from suitability of route for reducing incident-related congestion	Ability of proposed route to accommodate anticipated volumes of HGVs	Height restrictions	Weight restrictions	HGVs unable to negotiate diversion route due to alignment - e.g. by low-loaders grounding, car-transporters, cranes etc damaging adjacent/overhanging buildings	Sports venues, special events venues etc	Traffic management and control systems operating on proposed diversion route	Other risks?	Other risks?
Risk Assessment								

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TACTICAL DIVERSION ROUTES - RISK ASSESSMENT GUIDANCE								
Agency network Route:	-	Agency network Road location requiring diversion:	-	Proposed diversion on LHA road				
Identified Risks								
Risk Mitigation								
	Establish different diversion routes for each direction of travel	Hold all HGVs on the network	Hold all AILs, transporters, large cranes, selected AILs, etc on the network	Arrangements for LHA to manage diverted traffic on their network by changing normal traffic management and control	Avoidance of critical times, e.g. when activities at venues, special events etc affect the proposed diversion route are taking place	Other mitigation?	Other mitigation?	Other mitigation?
Risk Assessment								
Infrastructure improvements (where justified)	Alignment	Remove weight limits	Other improvements?	Other improvements?	Other improvements?	Other improvements?	Other improvements?	Other improvements?
Risk Assessment								

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7.7 Service requirements

7.7.1 Introduction

The National Timeline Model has been used as the framework for detailing these service requirements. The model identifies six conceptual phases to a typical incident on the Highways Agency’s network that threatens or is likely to threaten safety or cause congestion on the network. The phases correspond to the processes used by the major responding organisations during the management of incidents.

- **Detection** – The initial identification of a potential incident to an emergency service control room by a 999 call or an emergency service patrol vehicle, a Highways Agency control room by an emergency roadside telephone (ERT) call, CCTV, MIDAS, patrol vehicle or Traffic Officers, or a Service Provider control room by an Incident Support Unit or patrol vehicle.
- **Verification** – The clarification and confirmation of the extent and details of the incident as far as possible so that appropriate resources can be deployed.
- **Response** – The deployment of resources appropriate to the reported need to make the environment safe for all involved in the response and to the travelling public, to prevent escalation, to stabilise the situation and to provide immediate first aid for casualties.
- **Scene management** – The management of those activities that need to be completed at the scene before the location of the incident can be cleared, such as the further treatment and evacuation of casualties, the removal of hazardous chemicals, the investigation of the incident and collection of evidence and the implementation of diversions when required.
- **Recovery** – The recovery of vehicles, obstructions, obstacles and debris from the carriageway to the hard shoulder and the carrying out of essential repairs to the infrastructure.
- **Restoration** – The return of traffic flow to pre-incident levels following the recovery of vehicles, the clearance of obstacles and debris from the carriageway, the completion of any immediate repairs or temporary traffic management to make the infrastructure safe for use, and the removal of closure signs.

Pre-incident prevention and **post-incident debriefing** are considered as separate activities.

Incidents are not linear and the six phase model will not necessarily apply to every incident that has or can occur on the network. It identifies high-level phases, not explicit time periods. Phases will overlap and durations will differ between responders. However, the model applies to the most common and significant incidents and can be used by all responders as a reference tool for forward planning, incident debriefings, post-incident analysis and performance management.

Phases	Detection	Verification			Response		Scene Management			Recovery		Restore
Sub-phases	Alert control room & Initial verification	Initial Deployment	On scene verification	RCOPCON/ICC Ongoing Command, Control and Facilitation		HA/ISU Support	Police Aspects	FRS Aspects	Handover	Arrange Recovery	Scene Recovery	Remove Traffic Management
				Immediate Response	Ongoing Response							

An essential requirement for all aspects of incident management is to ensure that a time log of the incident is made and that decisions and other relevant information are recorded. This is a requirement for all responding organisations. All staff involved in incident management must be trained in the procedures and requirements which apply to their role. Section 7.15 details reporting and recording.

7.7.2 Detection



The detection phase of an incident is the period between an incident occurring and someone being aware of the incident. On busy parts of the Network this is often a very short period of time with no real process happening, whereas incidents can go undetected for longer periods of time on remote stretches of roads or when the roads are quiet.

The detection phase does not include any of the activity after any of the above has happened. Further activities are part of the verification phase. The most common detection sources are:

- members of the public alerting the police via 999 directed through the Police Incident Handling Centre (PIHC)
- members of the public alerting the RCC via emergency roadside telephones (ERT)
- routine police patrols
- routine Traffic Officer (TO) patrols
- Service Provider patrols
- technology within the RCC

All Service Provider staff involved in incident management must be aware of the requirements for the accurate reporting of incidents including those set out in the Emergency Control Procedures (Annex C) and those incidents which have not yet resulted in delay to traffic or to traffic collision. Each member of staff (including the staff of supply chain partners) must be trained to ensure that they know the correct procedure for reporting incidents, which will normally be through to the Service Provider's control room except when lives are immediately at risk, in which case the call must be made to '999'.

One of the primary functions of the Incident Support Unit is to detect and report incidents. However, it is just as likely that incidents will be detected by Service Provider staff carrying out patrols, surveys, routine maintenance etc., Highways Agency Area staff or other contractors, all of whom should be familiar with the correct procedure for reporting incidents of all kinds. Conscientious and accurate reporting by all who are working on the Network will assist in minimising the occurrence of incidents and the cost, delay and human consequences which they cause.

7.7.3 Verification

**OBJECTIVES FOR VERIFICATION PHASE**

The main objective of this phase is to determine sufficient detail about an incident to allow for the most appropriate deployment to be made.

Verification follows an incident being detected. The primary objective during verification is to ascertain that sufficient details are gathered about an incident to enable the most appropriate deployment of the resources of each responder to be made. Responding organisations will also be gathering information that may become useful should an incident become a criminal investigation.

The verification process can be split into three sub-phases:

1. Alerting the control rooms and initial verification
2. Initial deployment
3. On-scene verification

Logging details of incidents will occur on the Highways Agency and police Command and Control Systems and the Service Provider's incident logging system depending on incident involvement. The source of detection will affect which system initiates the log first but it is important that information is transferred between Police, Highways Agency and Service Providers quickly.

Sub-Phase 1 – Alerting the control rooms and initial verification

During this sub-phase, notification of the incident will be given to control rooms. The decision on whether the incident will be 'police-led' or 'HA-led' will be agreed. Note that the lead responder could change over the course of the incident management, either because issues are identified which were not initially apparent which require the police to take-over the lead, or because the requirement for police involvement has ceased and the remaining issues all fall within the Highways Agency's network management remit.

The Service Provider's control room will be informed of any relevant incident which may involve them in any way as soon as it has been logged by the RCC. The only exception to this is where it can be positively verified by CCTV that an ISU will not be required.

Service Provider's resources cover the Highways Agency's network and, therefore, are likely to detect incidents. Should Service Provider's resources detect an incident, they must inform their control room immediately who will in turn inform the RCC. The RCC will initiate a log and request Traffic Officer and/or police assistance immediately if required. If a police response is needed, the log, including all incident details, must be transferred to the PCO with a Unique Reference Number (URN).

Sub-Phase 2 – Initial deployment

At this stage of an incident, the precise details of an incident are unlikely to be known. The RCC will deploy Traffic Officers and will alert and request resources from the Service Providers via their control room. Service Providers must respond to any request for assistance from RCC or Police Control Office (PCO) through their control rooms. This is most likely to be the deployment of an ISU within the Service Provider's contractual response times (see ISU section), unless the ISU is already at the scene. In some circumstances the Service Provider may be required only to await a request for resources.

The Service Provider must consider requests for assistance from adjoining routes, areas and regions within their contingency plans.

Sub-Phase 3 – On-scene verification

The ISU must confirm their arrival with their control room. On arrival at the incident scene, the ISU must make the scene as safe as possible but will also begin verifying the scene through the control. Verification includes survey the scene from a distance having regard to safety, assess the incident, disseminate information to control room and others where necessary, approximate the number of casualties, identify present and potential hazards. The ISU and other responders will also confirm exact location (road, junction, map reference), confirm emergency services present and required, and confirm incident type and number of vehicles involved. The ISU must also assess whether any secondary resources are required and advise the control room accordingly. This will enable the control room to arrange the mobilisation of the required resources, not necessarily a request to bring those resources forward at that time, unless the control room is so advised. Chapter 8 (2006) provides guidance on (emergency) traffic management.

The Service Provider will liaise with RCC and NTCC/NILO during this phase and update them with the incident details and anticipated or actual consequences.

7.7.4 Response

**OBJECTIVES FOR RESPONSE PHASE**

The main objectives for this phase are to:

- stabilise the scene and assess Traffic Management requirements;
- make arrangements for support if necessary;
- control the incident to stop it worsening;
- tackle aspects of the incident that require immediate attention (e.g. casualties, fires, spillages).

The response phase begins when responders have verified the scene and confirmed and dispatched the necessary resources. The primary objective of the response phase is to stabilise the scene, control the incident to stop it worsening and tackle aspects of the incident that need immediate attention, e.g. casualties, fires and spillages.

The response phase includes the Highways Agency and Service Providers undertaking emergency traffic management to protect the scene. Resource will then be directed to supporting the emergency services and stabilising any infrastructure or non-hazardous spillages. This phase does not extend to actual recovery of the scene.

The response phase can be considered in two sub-phases:

1. Immediate response
2. Ongoing emergency response

Activities within the immediate response sub-phase are different across organisations. The Highways Agency and Service Providers will primarily be concerned with scene protection and will support the emergency services during this phase but will also be concentrating on protecting the scene and surrounding traffic.

Sub-Phase 1 – Immediate response

The immediate response sub-phase is concerned with responders undertaking the first steps necessary either to bring the scene under control, or allow other responders to operate safely. For the Highways Agency and Service Providers, this means protecting the scene using signs and signals or by setting up emergency traffic management, enhanced emergency traffic management or temporary traffic management in accordance with Chapter 8 (2006). The choice in temporary traffic management is dependent upon the estimated duration of the incident. Chapter 8 (2006) also details for traffic management for incidents restricted to the hard shoulder.

During 'Police led' incidents, the police are responsible for the ongoing management of the scene and the coordination of all responders. The command structure will be established in this phase. The other emergency services will focus on undertaking their core duties. If the incident allows, early assessment of infrastructure damage can be made to ascertain what secondary resources are necessary.

The RCC takes on a facilitation role, acting as an information hub and 'support command' for the Highways Agency. It also takes on a multi-agency facilitation role, coordinating additional resources such as vehicle recovery contractors. The PCO also takes on facilitation roles, but will typically concentrate on commanding police resources and co-ordinating the work of the other emergency services. The RCC will directly communicate with the Service Provider's control room.

Casualties that have been stabilised but need further hospital treatment will be evacuated as soon as possible, either in an ambulance or in an air ambulance. Air ambulance typically requires both carriageways to be closed due to the debris kicked up by the rotor blades and to minimise the risk of rubber necking causing secondary accidents. Prolonged on scene treatment can be more effective but there is a risk it can prolong the duration of the incident.

The Service Provider must request authority to access the hard shoulder from the incident lead through the RCC or PCO. The Service Providers must ensure that all response vehicles are liveried, all warning beacons and dipped headlights are in operation prior to joining and at all times whilst on the hard shoulder, that the driver is instructed to proceed at a speed appropriate for the prevailing conditions and never to exceed 20 mph and finally, is specifically advised to exercise extreme care having particular regard to the likelihood of both vehicles and pedestrians entering the hard shoulder from lane one without anticipating upstream traffic approaching from 'behind' their direction of travel.

Sub-Phase 2 – Ongoing emergency response

The ongoing emergency response sub-phase is typically the more significant phase in terms of stabilising the incident scene. With scene protection in place and a robust command and support structure, the emergency services will be able to tackle the incident safely and efficiently.

The priority for the Highways Agency and Service Providers during this sub-phase must be to continue to protect the scene, support the emergency services and to manage traffic in the surrounding area to minimise congestion. The RCC will continue to set signs and signals. The RCC will aim to minimise congestion on the immediate network through wider traffic management including junction closures, diversion routes and Local Authorities partnership working. Both the RCC and the Service Provider's control room will liaise with NTCC on the status of the incident to allow the NTCC to undertake strategic traffic management. The RCC and Service Providers must also liaise with the NILO to ensure all information is shared effectively and escalation procedures can be followed without delay.

The first priority for the Fire and Rescue Service is to handle fires that involve or are trapping casualties. Second priority is additional fires at the incident scene, which could be vehicle fires, embankment fires or road surface fires. The third priority for the Fire and Rescue Service is to help the Ambulance Service access casualties that are trapped at the scene.

The Fire and Rescue Service are also responsible for securing, containing and making safe any hazardous materials at an incident scene. The Service Provider's control room and ISUs must keep copies of drainage information, pollution control plans and plans showing location of highway electrical equipment. The identification of hazardous materials can be done by reading the vehicle's Hazard Warning panels. Once a material has been identified, the Fire and Rescue Service will seek advice from their contractors regarding how the material can be made safe. Industry guidelines are in place for how certain materials in certain states must be managed ranging from handling techniques, cooling processes or exclusion zones, the responsibility for which rests with the Service Provider. The Fire and Rescue Service are not responsible for the clearance of hazardous materials, but must leave it in a state that allows its removal from the scene. This includes any contaminated items used to contain the materials, e.g. contaminated water reservoir, foam, grit, etc.

The Fire and Rescue Service are responsible for health and safety of the inner cordon and will take primacy within the confines of the inner cordon, as recovery of trapped and injured persons takes precedence over any other investigative activity. The police will become responsible for the inner cordon following handover from the Fire and Rescue Service. The police will also establish an outer cordon restricting access to authorised personnel only.

The Fire and Rescue Service must ensure the scene is as safe as practicably possible and that all responders are aware of risks or hazards. The Fire and Rescue Service will advise on what personal protective equipment (PPE) is required and what equipment should or should not be used. When the Fire and Rescue Service leave the scene, they must advise remaining responders on risks, hazards and appropriate action to take.

The RCC and Service Provider's control room will utilise both Traffic Officers and Service Provider resources to implement traffic management. Traffic management may also involve dealing with traffic stranded between the incident scene and the road closure prior to the incident scene.

When it has become necessary to divert traffic away from the Highways Agency's network there, are in general, recognised diversionary routes. If a diversion is necessary, the RCC is to arrange the setting of signals (if available) informing motorists of the diversion. Further guidance on tactical diversion routes is included at Section 7.6.

The system of rearward relief is to turn the vehicles in the queue around and escort them back to the intended exit along the hard shoulder or, in some cases, via a cleared carriageway lane. Rearward relief should only be used if absolutely necessary and if traffic cannot be released by any other means, e.g. by opening a lane or creating hard shoulder running around an incident. Service Providers must only carry out this procedure under the instruction of Police and Traffic Officers. On trunk roads, cyclists and pedestrians should, if safe to do so, be escorted past the carriageway obstruction.

An emergency crossing point is a gap in the central reservation barrier. Service Providers must have the location of these emergency crossing points electronically available. These emergency crossing points should only be used by the emergency services or Traffic Officers, and only in extreme circumstances. The onus for carrying out such a manoeuvre safely is always on the driver, and all necessary care must be taken. It may be considered inappropriate to use crossing points during normal traffic flows. A short cut may be used instead. A short cut is a link road provided by the Highways Agency to reduce the distance travelled by emergency services attending incidents. Short cuts exist to enable emergency service vehicles and Traffic Officers access to another carriageway without travelling to the next junction.

When it is considered preferable for road users to leave their vehicles on the trunk road to enhance safety, e.g. as a result of chemical spillage or a fire, a pedestrian egress procedure will enable road users to leave the trunk road network in safety, e.g. via a pre-constructed pathway to a nearby local road. Careful consideration must be made to ensure that implementation of any pedestrian egress procedures does not increase the existing risk to road users. There are a number of standard infrastructure amendments that could assist with such a procedure, e.g. steps up/down a steep verge. Service Providers must address this issue within their contingency plans.

The Service Provider will also deal with damaged infrastructure obstructing the emergency services in their duties or creating potential danger, non-hazardous spillages and the mobilisation and, when required, deployment of secondary resources. Service Providers must also begin to assess the damage to the infrastructure and plan recovery but will typically not be able to start recovery. This will allow for preparations to be made in terms of arranging resources to be available as soon as the scene is handed over for recovery. Any access for the Service Provider or Highways Agency to

the scene for assessment must be with the permission of the leading commanding officer. If the scene is a crime scene, the Service Provider and Highways Agency will often need to be accompanied.

7.7.5 Scene Management



The scene management phase begins when the stabilisation and containment of the incident is completed. It covers the activities that are undertaken, predominantly by the police, to bring the scene to a state where the Highways Agency and others can begin recovery.

OBJECTIVES FOR SCENE MANAGEMENT PHASE

The main objectives for this phase are:

- any investigation by the police to take place in the event of criminal activities, fatalities or serious injury;
- containment of hazardous substances;
- assess as far as possible the requirements for the recovery phase and mobilise resources in readiness
- hand over from the police to the Highways Agency to undertake the recovery phase.

During this period, the following activities may be taking place to ensure the complete management of the scene: The TO Service and SP provide support to the emergency services.

1. Scene Investigation

During this phase, the police will be concentrating on their core responsibilities, determined by the type of incident. Incident scenes involving criminal acts, fatalities or serious injuries will need investigating for evidence collection. Any scene that still poses a risk to public safety will also require on going Police presence that will restrict the Highways Agency beginning recovery.

The scene management phase will end when the police agree to hand over control to the Highways Agency for recovery. Whilst the incident scene will in some cases remain protected and kept 'sterile', increasing efforts to mitigate resultant congestion will be made.

The scene management phase can be considered into four sub-phases:

1. Highways Agency and Incident Support Unit support
2. Police scene management
3. Hazardous materials substances
4. Scene handover

Sub-Phase 1 – Highways Agency and Incident Support Unit support

Highways Agency resources at the scene and in the RCC will jointly plan for recovery and restoration during the emergency response phase. The priority will be scene protection and safety, whilst supporting the emergency services in their role. The RCC, the Service Provider's control room, Traffic Officers and Service Provider resources will continue wider traffic management activities.

The police and Highways Agency will work together to ensure evidence collection or debris clearance is done in away that will allow the Highways Agency to open lanes to traffic as quickly as possible. Further guidance on incident investigation is held at Section 7.16.

The Highways Agency and Service Providers must continue with the planning of the recovery phase. All responders will begin alerting specialist recovery services through their control rooms and arrange holding points and rendezvous points. Resources will typically be held at a nearby junction rather than at the scene location. The RCC and Service Provider's control room must update the NTCC and NILO, who must ensure strategic traffic management and media updates are based on current information.

The Service Providers and Traffic Officers should seek to gain access to the incident scene to assess the damage and continue to plan the recovery phase. The Service Provider is responsible for identifying what, if any, remedial action will be undertaken and to provide advice to Traffic Officers as to when it should be carried out. This must be done at the earliest possible time as structural damage will inevitably cause the entire road to be closed for long periods. However, this may need to wait until the recovery phase, depending on the scene investigation. Depending on the level of delegation, Service Providers will consult the Area Performance Teams in relation to emergency works. The Service Provider must use the risk based decision process for safety fence and barrier repairs as included at Chapter 3.7.

If during an incident a highways structure, such as a bridge, is hit or is in close proximity to a fire, the affected road will be closed until a structural inspection and assessment has confirmed it safe. Service Providers must arrange and undertake the inspections, with police authorisation if necessary. The Area Performance Team and Service Provider may decide that work can be left until a later, more convenient or less critical time. Should the Highways Agency become the incident lead, the Traffic Officer Service or Service Provider (in conjunction with the appropriate Area Performance Team) will have the ultimate decision as to whether a road can be reopened. Continuous evaluation of the scene will happen throughout the scene management and recovery phase.

Sub-Phase 2 – Police Scene Management

The scene management phase is crucial to the police. During this phase, the cause of an incident is investigated, evidence is collected and suspects are identified. Much of the police work can be within a secure incident scene that will be restricted to other responders. This will keep the scene sterile ensuring evidence is not contaminated. Traffic Officers and Service Providers may not be given access unless accompanied by police.

When an incident involves a fatality, serious injury or criminal act, the Police will manage the incident in line with specific procedures. The scene will have been identified, secured and stabilised by the emergency services and, where possible, victims and suspects will have been identified. Other responder vehicles may need to be moved to capture all scene details. Before the scene management phase has started, additional Police resources needed will have been identified.

Precipitating and contributory factors will be identified through witness statements, CCTV, visual inspections. A scene conference will be held if necessary with all police resources and relevant supporting agencies. Scene investigation may be carried out by any number of specialists from several agencies. The police will collect evidence from the scene to support future prosecutions and Coroners inquests.

There may also be an investigation of areas beyond immediate scene including structures adjacent to the road, embankments, down stream of the incident. In some circumstances additional evidence can be collected after the incident has been cleared. It is, however, important for the Police that all evidence is collected from the scene before recovery starts. Any vehicle damage can be investigated on scene but can continue at a police holding yard.

Incidents can remain in police control due to risks to public safety. The role of the police will typically be to identify resource needed to manage the incident, coordinate resources, and consider

what safety measures are needed including exclusion zones and make operational decisions to reduce the risk of escalation. The RCC will continue its command and control role in these instances by calling Service Providers and responders identified by the police.

Sub Phase 3 – Hazardous Materials Substances

The Fire and Rescue Service is not routinely involved in the scene management phase as once fires are managed, trapped casualties freed and hazardous materials made safe, the scene will pass to other responding organisations. Scenes that will require Fire and Rescue Service may include ongoing hazardous materials containment or securing crime scenes that require input from a fire investigation team.

Service Providers must make arrangements for the cleanup of any spillages and the transportation of any hazardous materials through the utilisation of specialist services. Early notification of requirements to specialist contractors (through the Service Provider's control room) can reduce incident duration. In order to minimise overall incident recovery times it is possibly preferable to take steps to mobilise a service which may be required, even if they are subsequently stood down, than to delay mobilisation and possible jeopardise restoration of normal conditions. In the event of the incident being at an inappropriate stage for the specialist then they can be held at a convenient nearby location (e.g. service station) until the scene is ready for them.

Sub Phase 4 – Scene Handover

Once the Police are satisfied that a scene can be recovered, the incident lead is transferred to the Traffic Officer Service. The handover must be a managed process to ensure all parties are aware of the change. Once handover is complete and the Highways Agency have control, the incident will move to the recovery phase.

It is imperative that, throughout the incident, the handover of control from one organisation to another is recorded and communicated to all responders. The organisation receiving control must be aware of the hand over and this fact recorded. When receiving control of an incident whilst on scene, a Traffic Officer or Service Provider resource must obtain details of the person handing over control, inform the RCC and/or Service Provider's control room and request it is recorded on the Command & Control or incident logging system. The Service Provider must also inform the RCC from which organisation the incident has been handed over and their Unique Reference Number if known.

7.7.6 Recovery



The recovery phase begins when the police complete their investigations (if any) and hand over the incident scene to the Highways Agency.

OBJECTIVES FOR RECOVERY PHASE

The main objectives of this phase are:

- The removal of vehicles involved in the incident.
- The removal of debris as a result of the incident.
- The repair of any damage to the infrastructure (if circumstances are appropriate).
- Opening of the roads.

The key aim for the Highways Agency and Service Provider is to return the road back to its normal state safely, with minimum disruption to traffic flow.

The recovery phase involves the recovery of the network including the removal of vehicles and the repair of the infrastructure. Recovery largely depends on specific aspects of incidents, any restrictions placed on the recovery responders (local utilities, land ownership and usage) and the particular responder called by the incident lead. The key objective for the Highways Agency and Service Provider is to return the road back to its normal state safely, with minimal disruption to traffic flow and road users. Vehicle recovery objectives will be to remove the vehicle in the most appropriate manner, but this may not always be the quickest.

The number of responders will vary depending on the scale of the incident and recovery. Where there is simply debris on the road, the Traffic Officer may recover it themselves or may request the Service Provider to assist. More complex debris, spillages or damage to infrastructure will also often only require a Traffic Officer and Service Provider. It becomes more complicated when vehicles are involved and need to be recovered. Vehicle recovery, specialist recovery and additional resources should have been contacted by the Police, RCC and Service Provider during the scene management phase or earlier and should be at/nearby the scene or en route.

The Area Performance Teams will be aiming to get necessary repairs completed within minimum impact on congestion. Should the Highways Agency become the incident lead, the Traffic Officer Service or Service Provider (in conjunction with the appropriate Area Performance Team) will have the ultimate decision as to whether a road can be reopened.

This phase can be considered in three sub phases:

1. Arrange recovery
2. Scene recovery
3. Remove traffic restrictions

Sub Phase 1 – Arrange recovery

In most cases, vehicles that need recovering from the motorway network can be recovered by a service requested by the vehicle owner. The vehicle owner can request their own recovery service (e.g. AA or RAC) but the chosen service must attend within 30 minutes. If the owner is not a member of a recovery organisation they can arrange for recovery from a recovery organisation

through the police or RCC control room operators. Currently the process for deploying a vehicle recovery operator will depend on the contractual arrangements that the local Police force operate.

The police can invoke a statutory removal. Traffic Officers and Service Providers must also make a request to the police, through the RCC, to invoke a removal, particularly if the driver's preferred service can not attend within 30 minutes or if the driver will not accept the rota recovery operator and associated costs. Once alerted, a police contracted recovery operator must be on scene within 30 minutes or 45 minutes for a large goods vehicle (LGV).

A vehicle involved in a collision that results in a carriageway being blocked will be removed by police operators immediately with no owner preference. If the vehicle can be moved to the hard shoulder safely and the road reopened, the vehicle owner is able to request their own recovery. The trigger point for alerting a vehicle recovery operator varies nationally based on whether vehicle recovery operators receive an early warning of an incident or a just-in-time approach. Commercial aspects can drive this choice.

Requesting and arranging recovery operators can be undertaken by police, Highways Agency and Service Provider control rooms. Typically, the RCC will arrange for vehicle recovery contractors to attend a scene and the Service Provider's control room will arrange for contractors to enhance the Service Provider's capability (see Secondary Response section). Section 7.5 details the response times for secondary response. Where a Service Provider does not have the required capability for recovery, they are responsible for arranging the necessary resources. In these circumstances, the Highways Agency and Service Provider will work together to establish the best course of action.

Sub Phase 2 - Scene recovery

The overall objective of this sub phase is to remove all obstructions to traffic flow and repair any damaged infrastructure in the safest way and that will cause minimal disruption to road users. The scene recovery phase is the least predictable in terms of routine processes and procedures. Small scale debris clearance must be in line with Traffic Officer and Service Provider procedures, but more complex recoveries are managed in a more dynamic way. The number and type of responders will depend on the magnitude and complexity of the clearance. Service Provider's Incident Support Units are typically well equipped to deal with most incident clearances but will not always hold the equipment needed.

Where possible, a Traffic Officer or Incident Support Unit personnel can enter the live lanes without emergency traffic management to recover small pieces of debris. Where an incident scene contains manageable pieces of debris, the Service Provider must begin removing as much as possible from the carriageway. Where debris is too large to be recovered immediately, and where deploying a vehicle capable of handling it would further prolong the recovery phase, the Service Provider and Traffic Officer must consider moving debris to the hard shoulder or verge and recovering it later.

Spillages of non-hazardous materials or loads that are available for recovery must be cleared by the Service Provider. The Service Provider must also be responsible for recovering any substances the Fire and Rescue Services have used to contain and stabilise hazardous materials including water, foam, grit, etc. Where there is an environmental risk, the Service Provider must contact the Environment Agency for advice and in some cases, a response from Environment Agency officers. In some cases, the Service Provider will request support from additional responders (e.g. explosives, gas cylinders). This support will typically come from the relevant industry for which the material is used.

Any structures damaged or hit in an incident must not be used by traffic until an inspection has approved its use. The inspection and assessment of infrastructure will typically have taken place before full recovery gets underway. Where this has not been possible (e.g. due to investigations) the Service Provider must start assessing the damage as soon as possible. During peak periods the Service Provider must try to make the infrastructure safe and open the road as much as possible, and then return during off-peak periods to repair the damage. Damage to electrical infrastructure, such as lighting, must be assessed and isolated by a qualified engineer before it can be recovered.

Once all debris has been removed, the Service Provider will sweep the carriageway and inspect the surface for damage, if appropriate. The responders will pass the details of the owner to the Service Provider who must consider claiming compensation from the owner.

Sub Phase 3 – Removing traffic restrictions

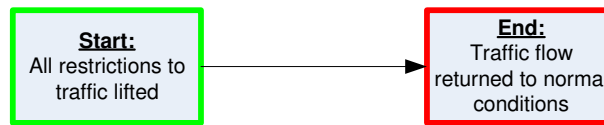
Once the recovery of the incident has been completed and all recovery responders have left the scene, Traffic Officers, Service Provider and Area Performance Team will need to agree that the road can be reopened.

The repairing of the infrastructure may not have been completed with the Area Performance Team and Service Provider agreeing to it being completed at a more convenient time (typically off-peak period). The Area Performance Team and Service Provider will recommend the road is reopened to the Traffic Officer Service but the decision to open rests with the Traffic Officer Service.

The closures that have been put in place throughout the incident duration will need to be removed. Physical closures (emergency traffic management and Chapter 8 lane closures) must be removed following the specific layouts removal procedure. Signal closures implemented by the RCC will stay in place whilst the physical traffic management is removed. Service Provider and Traffic Officers typically remove their own traffic management. The Service Provider must confirm with the RCC that the traffic management has been fully removed.

The RCC will lift signed lane closures following all physical closures being removed. Cancelling signs should be done as soon as possible to avoid confusion or ambiguity to the road user. Diversion signs should be removed and media announcements made. This phase only includes removing closures, not speed restrictions implemented by RCC. These will remain in place to help restore the traffic to normal conditions.

7.7.7 Restore



The restoration phase follows the incident scene being fully recovered and cleared. This phase represents the period of time necessary to restore the traffic conditions to a level expected for that time of day.

OBJECTIVES OF RESTORATION PHASE

The main objectives of this phase are:

- the restoration of traffic flow back to normal
- **use signs and signals by the RCC and NTCC to control congestion and assist traffic flows** to return to normal

The key aim for the Highways Agency and Service Provider is to return traffic conditions back to their normal state in a safe manner.

The restore phase represents the period of time necessary to restore the traffic conditions to a level expected for that time of day. The RCC is the key responder in this phase as all other responders will have left the scene following the recovery phase. The RCC will use the signs and signals to control congested traffic and allow conditions to return to normal quickly and safely. The NTCC will also continue to set strategic signs across the wider network to avoid traffic levels building up around the scene. The traffic management, tactical and strategic signing, that will have been implemented through the previous phases of the incident will have an impact on how quickly traffic conditions can be restored back to normal conditions.

Speed restrictions, warning signs and supporting information can be used by the RCC to control and inform road users in the vicinity of the incident. Signs and signals can be used as they would be for normal recurrent congestion. The Service Provider may also have mobile VMS available to assist although the deployment times often restrict their use in these circumstances. Service Providers will typically continue, in conjunction with the Traffic Officer Service, with the removal of traffic management during this phase. This will include removal of signing for slip road closures and tactical diversion routes when required.

The RCC and Service Provider's control room must continually liaise with NTCC and the NILO to ensure the media are up to date on the incident status and that the relevant information is disseminated to the public.

The Service Provider must ensure that records, reporting, hot debriefing and staff welfare requirements are attended to. The Service Provider must prepare for carrying out any permanent infrastructure repairs at the agreed time and ensure that normal levels of incident response resources are available to deal with any further incidents.

7.8 Debriefing

7.8.1 Incident Hot Debriefing

Routine de-briefing of incidents is without doubt the best way for the Highways Agency and its Service Providers to develop their abilities in incident management, congestion management, develop and maintain an effective safety culture, and share the experience gained to the benefit of all.

The incident cold debrief process, which is usually initiated following a major or critical incident, is discussed in Section 7.8.2. As can be seen from the cold debrief process chart, the decision to hold a cold debrief is influenced by the outcome of the hot debrief. It is therefore imperative that a consistent approach is applied when carrying out hot debriefs to ensure that outputs are captured and disseminated, locally, regionally and nationally.

Although this guidance is not intended to be prescriptive on the structure of the hot debrief as they are carried out in many different circumstances and situations, from the end of shift meeting to a post incident multi-agency debrief. It is however important to identify and capture the elements as outlined in 'Rationale' below as soon as possible after the incident, and in any case within 24 hours.

Purpose and objectives of the hot debrief – Unlike the cold debrief a hot debrief is an informal meeting to review a particular incident or situation from a Highways Agency perspective. Its objective is to review an incident from an operational perspective whilst fresh in the minds of those involved.

Rationale – Hot debriefs are carried out to:

- Identify what did, and did not go well during an incident
- Identify and address any staff welfare issues
- Identify any training issues
- Identify best practice
- Identify and capture any actions requiring referral to line manager/cold debrief process
- Identify any operational or procedural issues relating to other agencies

Roles and Responsibilities – The roles and responsibilities of those commonly involved in the Hot Debrief process are outlined below.

- Duty Supervisor
 - As a matter of routine, carry out end of shift debriefs covering all incidents occurring within their tour of duty.
 - Identify specific incidents occurring during their tour of duty requiring a hot debrief and make arrangements regarding time, location and attendees.
 - Notify duty operations manager of the intention to hold a hot debrief on specific incidents.
 - Where necessary record outcome of debrief on hot debrief report form.
 - Provide feedback to on-road and off-road staff.
- Duty Operations Manager
 - Where appropriate conduct hot debrief (e.g. following a major or critical incident).
 - Review hot debrief form submitted by supervisor, identifying any action at local, regional or national level.
 - Endorse hot debrief report form with comments and clearly identify further actions and direct the debrief form accordingly.

- Line Manager
 - The Line Manager should carry out the responsibilities as outlined for the duty operations manager where either the duty operations manager is not available or the issues revolve around personnel / welfare matters of one of their staff.

Hot Debrief Process – Service Providers must carry out hot debriefings routinely at the end of every tour of duty. It should be carried out by supervisors of both on road staff and control room staff. This may take the form of an end of shift meeting to review the day's events or a more focussed debrief on a specific incident or situation. A hot debrief of a specific incident must be carried out within 24 hours of the incident occurrence. The importance of debriefing as soon after the incident as possible cannot be overstated.

A hot debrief will always be carried out following major and critical incidents. For example where:

- Exceptional/significant damage has occurred to infrastructure
- Road users (*or others*) have experienced exceptional/significant disruption
- There has been multiple stakeholder involvement
- There was exceptional/significant environmental impact or potential impact
- Exceptional/significant delay duration
- Exceptional/significant number of vehicles involved

Annex 7.8.2 outlines the hot debrief process following the closure of an incident or end of tour of duty.

- Attendees - As a general rule, members of the Traffic Officer Service and/or Service Provider will attend the hot debrief. Where possible this should also include representatives of the RCC or the Service Provider's control room. It may be appropriate for representatives of other agencies to attend the hot debrief following critical or major incidents. In these circumstances the police in particular may choose to take the lead in a hot debrief. Even though this is the case it is important that the reporting and recording procedure for the Highways Agency is still followed.
- Facilitation – The duty supervisor should facilitate the hot debrief. Where appropriate, for example in relation to major and critical incidents or personnel/welfare issues, the debriefing will be carried out by the duty manager.
- Actions arising from the hot debrief – Where further actions are identified following the debriefing a hot debrief report form (Annex 7.8.9) should be completed by the senior person present and directed accordingly.
- Outcomes from debriefs – It is important to ensure that where actions are identified from hot debriefs appropriate feedback is given to the staff involved.
- Cross Boundary Arrangements – Where an incident has an impact on operations within another area a single Hot Debrief should be held if possible, in the Area where the incident occurred.

7.8.2 Incident Cold Debriefing

The Highways Agency believes that positive benefits can be gained from holding structured debrief meetings following incidents. It is the aim of this section to ensure that the Service Provider requirements are met for the needs of the cold debriefing.

The following information and data will be required for the incident cold debriefing:

- Incident logs in chronological order, starting with the earliest recorded entry in any of the participating stakeholders. The advantage of taking a chronological approach to debrief arrangements is that the process is in no way constrained by looking at specific aspects of incident management.
- CCTV footage
- Photographs

Annex 7.8.3 contains a suggested agenda for a cold debrief, which should be a simple 'walk-through' of an incident.

Initiation – As a general rule, a cold debrief should be considered for major and critical incidents, and initiated where:

- Exceptional/significant damage has occurred to infrastructure
- Road users (or others) have experienced exceptional/significant disruption
- There has been multiple stakeholder involvement
- There was exceptional/significant environmental impact or potential impact
- Exceptional/significant delay duration
- Exceptional/significant number of vehicles involved

A cold debrief must be called if specifically requested by any individual stakeholder.

Attendees – The attendees will be determined by the Service Manager, who should fully involve the Traffic Officer Service, where appropriate, in the debrief process. The decision on which attendees to invite should be dictated by stakeholder attendance at the incident, and those who are most likely to make effective contribution. Anyone who cannot attend, but who may have a contribution to make, should be given the opportunity to provide written input to the Service Manager.

Facilitation – The cold debrief will be undertaken using the suggested agenda in Annex 7.8.4 with actions recorded as in Annex 7.8.5. The cold debrief will catalogue, in chronological order, all events related to the incident until a clear picture is established (Annex 7.8.1). Once all information is catalogued, consideration should be given to the identification of lessons to be learned. In addition to actions arising, these should become the main outputs from the post-incident cold debriefs (Annex 7.8.1).

For information:

Actions formulation – A major documentary output from a post-incident cold debrief is the Traffic Operations Action Spreadsheet that is managed by the Area Performance Manager. This spreadsheet must clearly identify actions, owners of actions and provide mutually agreed timescales for any local, area or regional actions for completion. Failure to manage actions through to closure seriously undermines the validity of the post-incident Cold Debrief process. The spreadsheet will be disseminated across respective Area Performance Team's and Traffic Officer Service, and to Service Providers.

Lessons Learning & Dissemination – The Traffic Incident Management Workstream Leader will, with the assistance of Network Access & Resilience, filter the aggregated Regional Actions Spreadsheets in order to determine lessons to be learned and, good/bad practice in order of priority, and directorate. Following agreement at Network Resilience Team Meeting these must be submitted to the appropriate Divisional Directors, or TIM governance as considered appropriate, for approval and action to address identified problems (Annex 7.8.7)

Verification & Closure – The Traffic Incident Management Workstream Leader is responsible for monitoring progress on action resolution at a national level. They must also ensure that Divisional Directors responses are fed-back to the Network Resilience Team and that actions are implemented. Actions raised with Divisional Directors at a national level must be taken forward through the Network Resilience Team Meetings. At a regional level Network Performance Managers or Service Managers be accountable for achieving action closure within their area by implementing changes to existing practice within the mutually agreed timescales (Annex 7.8.8). Closure of actions, which are derived from the post-incident cold debrief, is a critical activity.

Cross Boundary Arrangements – Where an incident has an impact on operations within another area, or across national boundaries, a single Cold Debrief should be held in the Area where the incident occurred. The Service Manager must ensure that all attending agencies and appropriate neighbouring teams, are invited to the debrief.

TIM Bulletin - One method for the promotion of good practice identified in the debrief process is the TIM Bulletin, which is available for all (including Service Manager, Service Provider and stakeholders) through the Highways Agency's website at www.highways.gov.uk/timbulletin. The bulletin is updated monthly and the team that produce it encourage your comments, articles and contributions by e-mail to TIMbulletin@highways.gsi.gov.uk.

7.9 Service Standards and Requirements of Service Providers**7.9.1 Introduction**

This section identifies the service standards required of the Highways Agency and Service Providers in relation to their respective roles within incident management. These standards include response times, level of service and equipment requirements.

The principal requirement for incident management is the provision and use of an incident management team, comprising on- and off-road services. An effective response includes suitably qualified staff to support, direct and advise the on-road services, such as Incident Support Units. The Incident Support Units and other on-road response services must work closely together with the emergency and Traffic Officer services to provide repairs to the highway. The ISU and control room will have all the information on local highway assets, such as drainage systems, and act to prevent damage to infrastructure and contamination of outfalls and soakaways from incident spillage.

7.9.2 Control Room

The Service Provider must establish a 24 hours a day, 7 days a week control room to ensure that the Service Provider is the first to be contacted, after the emergency services, when an incident occurs. This service can be based in one of the RCCs which will assist in the development of communication and relationships. Regular communication with the police and Traffic Officer Service is essential to establish good relations to ensure early notification of incidents. The Service Provider must develop procedures with escalating service to respond to an incident.

7.9.3 Emergency Procedures and Planning Exercises

Participation in emergency procedures and planning exercises is considered an important part of engendering good communication between the parties involved in incident management. Further advice and information can be found in the Network Security Notices issued by the Service Manager.

Contingency planning takes place at a high level for emergencies on the network. However, there will be occasions when an incident takes place which, whilst not sufficient to invoke a full scale emergency, may cause a significant problem that will require special attention. The Service Provider must develop a Contingency Plan in accordance with Annex 7.8.12, that will deal with all incidents that occur on the network, including environmental incidents. It must include the legislative framework under which certain actions will be taken and the consultative interfaces that need to be followed in the decision-making process (e.g. emergency services, Environment Agency).

In developing this plan reference must be made to the Environment Agency's Pollution Prevention Guidelines (PPG21 – Pollution Incident Response Planning and PPG22 – Dealing with Spillages on Highways).

7.9.4 Meeting the Performance Requirement

The Service Provider must advise the appropriate bodies (e.g. Police, Traffic Officer Service) of any emergency or category 1 defect that may disrupt traffic flow, immediately the defect or emergency has been identified. The role of Incident Support Unit is crucial in working with the emergency services/Traffic Officer to deal with the incident and restore the operation of the network. The Traffic Officer Service use incidents grading to determine the measure of the response required. These gradings are given in the table below.

Grading	Definition
EARLY RESPONSE	Any incident where immediate deployment is required and a lack of early resolution will lead to deterioration in circumstances surrounding the incident.
ROUTINE	Any incident where attendance can be programmed within normal duties with a maximum time limit of 24 hours.

Service Provider's Incident Support Unit response times must be defined in the Service Provider's contract. The response time is defined as the time elapsed from initial notification to the Service Provider's control room to the time of notification of arrival on the scene of the emergency incident by the ISU. However, the table below should be taken as a baseline and any amendments to these response times must be in written agreement of the Service Manager. Route classification must be in agreement with the Service Manager.

National Response Times Framework¹	Priority 1 Routes	Priority 2 Routes
04:00hrs-20:00hrs	20 minutes	45 minutes
20:00hrs-04:00hrs	60 minutes	60 minutes

¹ The response times are an ABSOLUTE and shall not be taken as an average.

7.10 Temporary Traffic Management Vehicles

Vehicles used for the installation, maintenance and removal of static traffic management on high speed roads must comply with the requirements of the Traffic Signs Manual Chapter 8, Part 2, available for download from the DfT website (<http://www.dft.gov.uk/pgr/roads/tss/tsmanual/>). For ease of reference those requirements are duplicated in the following paragraphs. Compliance with these specifications is also recommended for use on all types of highway irrespective of speed limit.

7.10.1 Inspection/Supervisor vehicles

- Conspicuous colour (yellow or white is recommended);
- 70mm capital letter height “HIGHWAY MAINTENANCE” sign to diagram 7404 (externally mounted on rear of vehicle)
- Roof-mounted amber light bar (visible 360⁰) with a minimum of two independent light sources;
- “Class Ref 2” to BS EN 12899-1 or microprismatic reflective markings on the rear of the vehicle in accordance with 7.10.6 (c) or (d);
- Company or client livery on side of vehicle.

7.10.2 Traffic Management/maintenance vehicles (personnel/equipment carrier)

- Conspicuous colour (yellow or white is recommended);
- 140mm capital letter height “HIGHWAY MAINTENANCE” sign to diagram 7404 (externally mounted on rear of vehicle);
- “Class Ref 2” to BS EN 12899-1 or microprismatic reflective markings on the rear of vehicle in accordance with 7.10.6;
- All seats must be fitted with head restraints and 3 point inertia reel belts;
- Working lights;
- Reversing bleeper;
- Front roof-mounted amber light bar (visible 360⁰) with a minimum of two independent light sources, and rear mounted amber flashing beacons (visible 360⁰);
- Company or client livery on side of vehicle;
- High visibility strip along side of vehicle; and
- CCTV for rearward vision.

7.10.3 Equipment installation/removal vehicles

- Conspicuous colour (yellow or white is recommended);
- 140mm capital letter height “HIGHWAY MAINTENANCE” sign to diagram 7404 (externally mounted on rear of vehicle);
- “Class Ref 2” to BS EN 12899-1 or microprismatic reflective markings on the rear of vehicle in accordance with 7.10.6;
- All seats must be fitted with head restraints and 3 point inertia reel belts;
- Working lights;
- Reversing bleeper;
- Front roof-mounted amber light bar (visible 360⁰) with a minimum of two independent light sources, and rear mounted amber flashing beacons (visible 360⁰);
- Company or client livery on side of vehicle;
- High visibility strip along side of vehicle;
- Special adaptation to provide a low level working platform with a guard rail arrangement within the normal width of the vehicle (e.g. tail lift or well);
- Driver/operative intercom system; and
- CCTV for rearward vision.

7.10.4 Impact protection vehicles

- Conspicuous colour (yellow or white is recommended);
- 10 tonne minimum on the road weight;
- Lorry-mounted crash cushion (LMCC) ;
- Automatic brake activation system ;
- Signing equipment;
- Light arrow sign;
- Reversing bleeper;
- 140mm capital letter height "HIGHWAY MAINTENANCE" sign to diagram 7404 (externally mounted on rear of vehicle);
- "Class Ref 2" to BS EN 12899-1 or microprismatic reflective markings on the rear of vehicle in accordance with 7.10.6 (c) or (d) when the cushion is in the stowed position;
- Front-mounted amber light bar with two independent light sources, and rear mounted amber flashing beacons visible when the cushion and the light arrow are in the stowed position;
- All seats must be fitted with head restraints and seatbelts with a minimum of three points of anchorage to the vehicle; and
- CCTV for rearward vision.

7.10.5 Notes

1. A vehicle complying with this specification can also be used for the installation and removal of longitudinal coning as long as it is fitted with a special adaptation to provide a low-level working platform with a guard rail arrangement within the normal width of the vehicle i.e. a "coning well".

The light arrow sign must not display any form of arrow when on a hard shoulder of a dual carriageway or when on a two-way single carriageway road.

7.10.6 Rear Markings

High visibility rear markings should comprise either:

- (a) signing to diagram 7403, or
- (b) the alternative light arrow sign, or
- (c) chevron markings comprising alternate strips of fluorescent orange-red retroreflective material and fluorescent yellow non-retroreflective material, of not less than 150mm width each, inclined at 45-60° to the horizontal and pointing upwards, or
- (d) a solid block of fluorescent orange-red retroreflective material.

7.11 Incident Support Units: Livery

This chapter contains details of the Specification for ISU Vehicles: ISU Vehicle (Section 7.11.2) and Flat Bed Lorry (Section 7.11.3).

7.11.1 General

Further advice concerning this chapter, and on manufacturers of material meeting the specification, can be obtained from the Service Manager.


The Highways Agency's swoosh is no longer specified for inclusion on vehicles. New vehicles should be branded in accordance with the requirements of this chapter. The original photographs showing vehicle livery have been artistically manipulated to illustrate the revised branding requirements.



All open cell prismatic material must be sealed at the edges to prevent water and dirt ingress.

The correct corporate proportions of the Highways Agency logo must be maintained within the constraints of the vehicle's body panel contours. Further advice on the HA logo is included at 7.11.6 and contained in the HA **Communications Strategy** and **Brand Guidelines** documents.

Any vehicle stopping on the highway for works purposes or inspections should be of a conspicuous colour (e.g. yellow or white). The Traffic Signs Manual Chapter 8, Part 2 recommends a non-reflective yellow colour, No. 355 (lemon) to Table 1 of BS 381C: 1996 "Specification for colours for identification, coding and special purposes" be used.

7.11.2 ISU Vehicle

PROFILE	SPECIFICATION
<p style="text-align: center;">FRONT</p> 	<p>Fluorescent yellow vinyl material so far as vehicle contours allow on bonnet and above windscreen permit.</p> <p>Refer to 7.11.4 for Vehicle Colour / Material Specifications and 7.11.5 for Livery Film Specifications.</p> <p>"INCIDENT SUPPORT", with "UNIT" centrally placed there under, on bonnet in reverse script Helvetica font, 100mm high, in glass bead material and colour Pantone® 287 (HA Blue 1). 50mm (or 25mm depending upon width available) white retro-reflective high grade material* to fit front windscreen pillars.</p>

PROFILE	SPECIFICATION
<p style="text-align: center;">LOWER SIDE PANEL</p> 	<p>Diagonal stripes in alternate fluorescent yellow retro-reflective (dual-purpose) material* and fluorescent orange vinyl material at 45° and 600mm wide.</p> <p>Both stripes to extend as high as highest side window bottom edge.</p> <p>Chevrons should run from front to rear of vehicle, and begin with orange stripe at front wing.</p> <p>No additional vehicle outline markings are required.</p>
<p style="text-align: center;">MIDDLE SIDE PANEL</p> 	<p>To be filled with fluorescent yellow vinyl material overlaid with non-reflective 'HIGHWAYS AGENCY' corporate logo.</p> <p>See 7.11.6 for HA Vehicle Corporate Branding Guidelines.</p> <p>"INCIDENT SUPPORT UNIT" to be non reflective black vinyl material in Helvetica font, nominal 150mm high, however can be amended to fit with HA corporate logo depending upon size of middle side panel.</p>
<p style="text-align: center;">TOP SIDE PANEL</p> <p style="text-align: center;">See Previous 2 photographs</p>	<p>Diagonal alternate stripes to be fluorescent yellow retro reflective (dual-purpose) high grade material* and fluorescent orange vinyl material at 45° and 600mm wide</p> <p>Both sets of stripes to continue as extended diagonal from lower side panel.</p>

* All retro reflective materials must be of the highest available grade, unless stated otherwise.


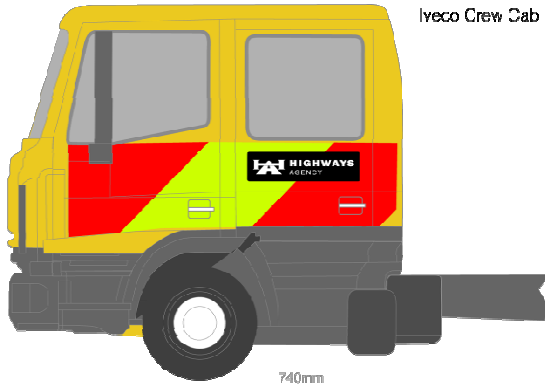
PROFILE	SPECIFICATION
<p>REAR</p> 	<p>Chevron scheme (pointing 'Up') at 60° in fluorescent yellow retro reflective (dual-purpose) material* and fluorescent red retro-reflective (dual-purpose) material*, in stripes 250mm wide.</p> <p>“HIGHWAYS AGENCY” to be 100mm high in Helvetica font at top of rear doors in blue glass bead material colour to be Pantone 287 (HA Blue 1) on fluorescent yellow vinyl background.</p> <p>“MOTORWAY MAINTENANCE” to be 100mm high, Transport Alphabet (Heavy) font in black non-reflective material at bottom of rear doors. (Ref: Traffic Signs Regulations and General Directions, 7404.)</p> <p>The rear vehicle outline in red retro-reflective high grade material* 25mm wide around door pillars and roof edge (and on rear bumper if space permits).</p>
<p>Additional 'Internal' Vehicle Markings</p> 	<p>The internal outer edges of the open rear doors to be marked in red retro-reflective high grade material*, 25mm wide, and across open roof edge and floor sill where space permits.</p> <p>Similar treatment to be applied to side door internal door surrounds.</p>

* All retro reflective materials must be of the highest available grade, unless stated otherwise.

7.11.3 ISU Flat Bed Lorry

PROFILE	SPECIFICATION
<p>FRONT</p> 	<p>Fluorescent yellow vinyl material so far as vehicle contours allow on bonnet and above windscreen</p> <p>Refer to 7.11.4 for Vehicle Colour / Material Specifications and 7.11.5 for Livery Film Specifications.</p> <p>“INCIDENT SUPPORT”, with “UNIT” centrally placed there under, on bonnet in reverse script Helvetica font, nominally 100mm high, in glass bead material and colour Pantone® 287 (HA Blue 1). Letter height can be amended dependant upon size of vehicle front panel.</p>

* All retro reflective materials must be of the highest available grade, unless stated otherwise.

PROFILE	SPECIFICATION
<p style="text-align: center;">SIDE (INDICATIVE ONLY)</p>   <p style="text-align: right; margin-right: 50px;">Iveco Crew Cab</p> <p style="text-align: center; margin-top: 10px;">740mm</p>	<p>Diagonal stripes in alternate fluorescent yellow retro-reflective (dual purpose) high grade material* and fluorescent orange vinyl material at 45° 600mm wide.</p> <p>Both stripes to cover lorry side panels and to extend as high as bottom edge of highest side window with sufficient space being left for HA logo to be fitted on side of lorry cabin.</p> <p>Chevrons should run from front to rear of lorry and begin with orange stripe at front wing.</p> <p>Highways Agency corporate logo to be located immediately above or below cab window – as space permits, dependent on cab design but leaving sufficient area of red/yellow stripes (preferably minimum 600mm high). [See Note at end of this Specification]</p> <p>Refer to 7.11.6 for HA Vehicle Corporate Branding Guidance.</p> <p>Vehicle outline markings in 50mm, (or 25mm dependent on space available) to be applied in yellow high visibility reflective marking tape (to ECE104 Regulations) as appropriate, dependent on vehicle type, including on any vertical struts.</p>

* All retro reflective materials must be of the highest available grade, unless stated otherwise.

PROFILE	SPECIFICATION
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REAR (Indicative Only)



Chevron scheme (pointing 'Up') at 60° in fluorescent yellow retro reflective (dual-purpose) material* and fluorescent red retro-reflective (dual-purpose) material*, in stripes 250mm wide.

"MOTORWAY MAINTENANCE" to be 100mm high Transport Alphabet font (medium) in black non-reflective material on yellow (non-reflective material) background to be located towards bottom of rear chevrons.(Ref. Traffic Signs Regulations and General Directions, Sign 7404.)

Rear vehicle outline in red retro-reflective high grade material* 50mm (or 25mm depending upon space available) wide around edges, on any vertical struts and on rear lower 'fender'. Consideration should also be given to infilling the rear framework, where appropriate, in order to enlarge the area of rear chevrons

See alternative arrangement below.

Alternative Arrangement for Rear of Lorry



Note – the photo opposite shows the preferred livery arrangement, incorporating an in-filled rear framework and high level panel with chevron and rear amber beacons.

Chevron scheme (pointing 'Up') at 60° in fluorescent yellow retro reflective (dual-purpose) material* and fluorescent red retro-reflective (dual-purpose) material*, in stripes 250mm wide.

Where rear crash cushions are used, the same rear diagonal chevrons should also be added on both vertical and horizontal faces.

NOTE - national requirement for the client livery to be shown on the side of the vehicle (see Traffic Signs Manual Chapter 8, Part 2).

* All retro reflective materials must be of the highest available grade, unless stated otherwise.

7.11.4 Incident Support Unit: Livery details

Position	Colour	Colour Ref:	Use	Material	Film Manufacturers ⁽¹⁾ 1. 3M United Kingdom Plc 2. Rennicks (UK) Limited 3. Reflexite UK Ltd Part Numbers	Comments
FRONT	Yellow	See part number	Bonnet / Above Windscreen	Fluorescent vinyl	1. 3M™ Scotchcal™ Saturn Yellow 3485 2. Nikkalite™ Hi-Cal Fluorescent Film 7F-310 3. Reflexite VC312 Daybright Fluorescent Yellow (L1)	Bonnet livery is to be one complete 'body wrap'. It is recommended that the fluorescent panel above the windscreen be applied as a single panel
	Blue	Pantone 287	'Highways Agency' lettering	Glass bead	1. 3M™ Reflective Film SL680-10 plus White with digitally printed blue ink to match Pantone 287 2. Nikkalite™ Flexible Engineering grade (SEG) 48006 3. n/a	
	Yellow	See part number	Top of windscreen	Fluorescent vinyl	1. 3M™ Scotchcal™ Saturn Yellow 3485 2. Nikkalite™ Hi-Cal Fluorescent Film 7F-310 3. Reflexite VC312 Daybright Fluorescent Yellow (L1)	
SIDE	Yellow	See part number	Side Top and Lower Panels - Diagonal Stripes	Fluorescent retro reflective	1. 3M™ Diamond Grade™ Fluorescent Yellow Green 9963 2. Nikkalite Crystal Microprismatic Vehicle Conspicuity Film (CRG) 92844 3. Reflexite VC312 Daybright Fluorescent Yellow (L1)	It is recommended that the fluorescent yellow retro reflective top and lower sections be applied as a single panel with the fluorescent orange diagonal Stripes superimposed on top.
	Yellow	See part number	Side Middle Panel	Fluorescent vinyl	1. 3M™ Scotchcal™ Saturn Yellow 3485 2. Nikkalite™ Hi-Cal Fluorescent Film 7F-310 3. Reflexite VC312 Daybright Fluorescent Yellow (L1)	It is recommended that the fluorescent yellow middle section be applied as a single panel with the HA Logo and 'Incident Support Unit' lettering superimposed on top.
	Orange	See part number	Side, Top and Lower Panels Diagonal Stripes	Fluorescent vinyl	1. 3M™ Scotchcal™ Fluorescent Film 3484 Orange 2. Hi-S Cal Orange Fluorescent Vinyl 7F-240 3. Reflexite VC312 Daybright Fluorescent Orange	
	White	See part	Front windscreen	Retro reflective	1. 3M™ Diamond Grade 980-10 White	

Position	Colour	Colour Ref:	Use	Material	Film Manufacturers ⁽¹⁾ 1. 3M United Kingdom Plc 2. Rennicks (UK) Limited 3. Reflexite UK Ltd Part Numbers	Comments
		number	pillars		2. Nikkalite Crystal Microprismatic Vehicle Conspicuity Film (CRG) 92802 3. Reflexite VC312 Daybright Silver (15)	
	Black	See part number	'Incident Support Unit' Lettering	Non-reflective vinyl	1. Scotchcal 100/12 (Non-reflective black) 2. Hi-S Cal Black Non-Reflective Vinyl V803 3. Black Non-reflective vinyl	
REAR	Yellow	See part number	Chevrons	Fluorescent retro reflective	1. 3M™ Diamond Grade™ Fluorescent Yellow Green 9963 2. Nikkalite Crystal Microprismatic Vehicle Conspicuity Film (CRG) 92844 3. Reflexite VC312 Daybright Fluorescent Yellow (L1)	It is recommended that the fluorescent retro reflective yellow be installed as a single panel with the red chevrons applied on top.
	Red	See part number	Chevrons	Fluorescent retro reflective	1. 3M™ Diamond Grade™ 980-72 Red 2. Nikkalite Crystal Microprismatic Vehicle Conspicuity Film (CRG) 92805 3. Reflexite VC312 Daybright Fluorescent Red (12)	It is recommended that the fluorescent retro reflective red chevrons be applied on top of a single panel of fluorescent retro reflective yellow.
	Black	See part number	'Motorway Maintenance' lettering	Non-reflective vinyl	1. Scotchcal 100/12 (Non-reflective black) 2. Hi-S Cal Black Non-Reflective Vinyl V803 3. Black Non-Reflective Vinyl	
	Blue	Pantone 287	'Highways Agency' lettering	Glass bead	1. 3M™ Reflective Film SL680-10 plus White with digitally printed blue ink to match Pantone 287 2. Nikkalite™ Flexible Engineering grade (SEG) 48006 3. n/a	
	Red	See part number	Vehicle Outline + Internal Edges of Open Rear Door	Retro reflective	1. 3M™ Diamond Grade™ 980-72 Red 2. Nikkalite Crystal Microprismatic Vehicle Conspicuity Film (CRG) 92805 3. Reflexite VC312 Daybright Fluorescent Red (12)	

Position	Colour	Colour Ref:	Use	Material	Film Manufacturers ⁽¹⁾ 1. 3M United Kingdom Plc 2. Rennicks (UK) Limited 3. Reflexite UK Ltd Part Numbers	Comments
<p>Notes</p> <ol style="list-style-type: none"> 1. All retro reflective material must be of the highest available grade, unless stated otherwise. 2. This list does not form a recommendation, nor is it exhaustive. Other companies may offer film manufacturer services and it is the responsibility of individual procurement officers to determine their suitability. 3. Reference should be made to 7.11.5, with regard to Livery Film Specification. 4. Pantone® is a register trade mark. 						

7.11.5 Livery Film Specification

The following forms a recommendation for the minimum level of performance of livery films that would be acceptable if the conspicuity benefits of the livery scheme are to be realised over a typical three year vehicle lifespan.

General Product Information

Material thickness	Preferably less than 1.7mm
Orientation requirements	As per manufacturer's instructions
Applicable automatic cutting methods	Die, plotter or manually cuttable using laser or knife
Life expectancy	As per manufacturer's advice
Warranty period	As per manufacturer's advice
Temperature range	-25°C to 50°C

Coefficient of Retro reflection (R_A) Minimum Values

Observation Angle	Entrance Angle	R_A				
		Fl. Yellow-(Green)	Fl. Orange	Blue	White	Red
0.20°	5°	300	160	25	350	60
	30°	150	80	12	150	25
	45°	33	18	3	40	7
33°	5°	80	80	10	150	25
	30°	60	50	4	60	10
	45°	16	20	2	30	5
0.50°	5°	50	45	7	110	20
	30°	20	20	3	60	10
	45°	9	8	1.3	20	3.6
1.00°	5°	8	8	1	9	2.5
	30°	6	4	0.75	6	1
	45°	2	2	-	3	-

Coefficient of retro reflection, R_A , is a measure of the amount of light radiation retro reflected from a surface relative to the amount of light radiation incident upon the surface, per unit area. Units are candelas per lux per square metre, $\text{cd.lx}^{-1}.\text{m}^{-2}$. Further details are available from CIE publication 54.2 - 2001

NOTE: These values are similar to those quoted in BS873: 1983 and ASTM D 4956 – 01a.

Maximum Permissible Retro Reflectivity Degradation

Performance Degradation	Fl. Yellow-Green	Fl. Orange	Blue	White	Red
Acceptable maximum degradation	50%	20%	20%	20%	20%
Degradation period	3 years	3 years	3 years	3 years	3 years

NOTE: These values are per ISO 4892-1: 1994 and ISO 4892-2:1994.

Daytime and Night-time Chromaticity

Daytime Chromaticity	CIE D65 Illuminant							
	1		2		3		4	
	x	y	x	y	x	y	x	y
Fl. Yellow-Green	0.375	0.620	0.460	0.532	0.398	0.450	0.350	0.508
Fl. Orange	0.506	0.404	0.570	0.429	0.655	0.345	0.560	0.340
Blue	0.065	0.216	0.190	0.255	0.245	0.210	0.144	0.030
White	0.285	0.325	0.335	0.375	0.355	0.355	0.305	0.305
Red	0.550	0.358	0.640	0.365	0.735	0.265	0.660	0.233

NOTE: These values are similar to those quoted in BS 873: 1983 and ASTM D 4956 – 01a.

Footnote: Night-time chromaticity data are not yet available. This Highways Agency will publish a revised livery film specification when necessary.

Fluorescent and Non-Fluorescent Luminance Factor

Fluorescent materials	Luminance factor β , min		
	CIE D65		
	β_{Total}	$\beta_{Fluorescent}$	β_{Total}
Fl. Yellow-Green	30	15	40
Fl. Orange	15	7	15
Blue	0.7	N/A	N/A
White	17	N/A	N/A
Red	0.5	N/A	N/A

(N/A – Not Applicable)

Standards Compliance

Impact Resistance	ASTM D4956 – 01a: 6:10 or ASTM D2794 –93
Shrinkage	ASTM D4956 – 01a: 6.6
Flexibility	ASTM D4956 – 01a: 6.7
Chemical/solvent resistance	BS 873: Part 1:1983 section 12 (solvent wipe test) Chemicals – at minimum, must be resistant to diesel, petrol and LPG that can occur during refuelling Solvents – at minimum, must be resistant to white spirit, turpentine, kerosene and cleaning solutions likely to be used

Power Washing

The film, as applied to the vehicle and conditioned as necessary, must withstand washing during routine maintenance under the conditions specified below.

Maximum fluid temperature	38°C or higher
Minimum incident angle of spray axis	15° or less to perpendicular of surface i.e. as near to 90° (right angles) with surface that is being cleaned, as possible
Nozzle distance from surface	1.2 meters or further – any closer risks damaging the livery edge seal
Nozzle pressure	75 bar/ 80 psi or less.
Spray fan pattern required	As per manufacturer's instructions i.e. direct jets of water should be avoided, water should be 'sprayed' out if possible

When time permits, vehicles should be hand washed with soapy water, using a soft sponge.

NOTE: These values should be considered to be minimum performance guidelines for livery film materials. If specific films are resistant to cleaning at a higher temperature, incident angle or pressure or at a shorter distance between the nozzle and the film surface, this may be considered to be superior performance.

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7.11.6 HA Vehicle Corporate Branding Guidelines

Vehicle Artwork – for intended use scale up or down in proportion only. Always use master artwork files for this and never change the direction of the artwork. To obtain these files refer to contact details in notes at end of this specification. The colours on this page are meant to be representational only. When specifying colour always include the relevant Pantone® colour chip.

The full colour logo is the preferred logo and should be used - where practicable - on white or light backgrounds.



Alternative logos are shown, in order of preference of colour use – most preferred on the left. The black logo should only be used on winter service spreading and maintenance vehicles that have a yellow or orange background.



A reversed out logo (white out of a blue or black panel) should be used on difficult backgrounds e.g. reflective stripes. The 'square' logo should only be used in exceptional circumstances. Shown in order of preference of colour use – most preferred on the left.



Logos should be applied to door panels wherever possible.

DO NOT USE THE ABOVE BITMAP AS ARTWORK

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7.11.7 Incident Support Unit Vehicle / Lorry Livery: Additional Information

The overall scheme livery must include the following:

- All panels must be hermetically edge sealed. (Reference should however be made to the Manufacturer's instructions as some livery materials do not required edge sealing.)
- All stripes must be cut in the same orientation to maximise reflectivity and colour
- All work must be Quality Assured to ISO 9002
- Livery film must not be folded over the edges and cut-outs of vehicle panels, but instead must be cut short of them. It is recommended that a clear fuel-resistant film is fitted over the fuel filler area; reference should be made to the manufacturer's instructions as this may not be necessary.

Cutting of Livery Materials

Livery film can be easily cut using a sharp knife or scissors. Every panel / stripe must be edge sealed to prevent water and dirt ingress; where in doubt the manufacturer's instructions must be followed. Some companies offer livery film panels pre-cut to the correct size and shape for application to specific vehicles. A list of some of these companies can be found in below.

Material Performance

It is for individual procurement officers to secure warranties on material performance and edge sealing, however the following is offered as a guideline:

- Fluorescent retro reflective materials: yellow (light colours) 2 years, with darker colours e.g. red, having a working life of up to 5 years. Also high grade materials e.g. Crystal / Diamond / Daybright tend to perform to specification, for longer
- Fluorescence only materials, especially lighter colours, 2 years
- Vinyl Films – 3 years

It is the vehicle marking companies (See below) who will offer warranties on livery markings, not the material manufacturers. These figures are for guidance purposes only, warranties on livery life will vary according to the materials used and the application process, which should always be in accordance with the manufacturers' instructions.

Care should be taken when power washing vehicles, edge sealing is not a barrier against pressure washing, to damage to the livery film. (See 7.11.5 – Power Washing.)

*Vehicle Marking Companies and Film Manufacturers**Vehicle Marking Companies*

HALO Bluelite Limited
64 Victoria Road, Burgess Hill, West Sussex, RH15 9LH
Telephone: +44 (0) 1444 232366
Fax: +44 (0) 1444 232376
Website: <http://www.halogroup.co.uk>

Kay Premium Marking Films Ltd.
Oakwood Close, Penyfan Industrial Estate, Crumlin, Newport, NP11 3HY, Wales, UK
Telephone: +44 (0) 1495 242300
Fax: +44(0) 1495 249446
Email: sales@kpmf.com
Website: <http://www.kpmf.com>

PVL UK Ltd. (formerly Preview Graphics Ltd.)
Unit 1, Avocet Trading Estate, West Sussex, Burgess Hill, RH15 9NH
Telephone: +44 (0) 1444 258 980
Fax: +44 (0) 1444 258 981
Email: info@pvluk.com
Website: <http://www.pvluk.com>

Ringway Vehicle Graphics
Winterstoke Road, Weston-Super-Mare, Somerset, BS24 9BQ
Telephone: +44 (0) 1934 421400
Fax: +44 (0) 1934 421401
Email: sales@rvgonline.co.uk
Website: <http://www.rvgonline.co.uk>

Fenn Graphics Ltd
Fenn House, Duke Street, Fenton, Stoke-on-Trent, ST4 3PT
Telephone: +44 (0) 1782 344199
Fax: +44 (0) 1782 344055
Email: admin@fenngraphics.co.uk
Website: <http://www.fenngraphics.co.uk>

Please Note: This list does not form a recommendation, nor is it exhaustive. Other companies may offer professional livery application services and it is the responsibility of individual procurement officers to determine their suitability.

Film Manufacturers

3M United Kingdom Plc.
3M House, 28 Great Jackson Street, Manchester, M15 4PA
Telephone: +44 (0) 161 237 6394
Fax: 0800 378127
Website: <http://www.3M.com/uk>

Reflexite UK Ltd
4420 Nash Court, John Smith Drive, Oxford Business Park South, Oxford, OX4 2RU
Telephone: +44 (0) 1865 396 959
Fax: +44 (0) 1865 396 960
Website: <http://www.reflexite-europe.com>

Rennicks (UK) Limited

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Stuart Road, Manor Park, Runcorn, Cheshire, WA7 1TS
Telephone: +44 (0) 1928 579 966
Fax: +44 (0) 1928 579 965
Website: <http://www.rennicksuk.com>

Please Note: This list does not form a recommendation, nor is it exhaustive. Other companies may offer film livery materials and it is the responsibility of individual procurement officers to determine their suitability.

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7.12 Incident Support Units: Equipment

The temporary traffic management equipment must at least be in accordance with the Design Document of Chapter 8 (2006). All items of equipment used for temporary traffic management must fulfil their intended legal and informative function throughout the period they are in position. This applies to all signs, delineators, markings, traffic signal equipment and road danger lamps.

Each ISU must carry a comprehensive range to deal with a wide range of emergency situations. The minimum equipment to be carried is as set out in the table below. Additional equipment may need to be carried to reflect the nature and frequency of incidents within particular areas.

A GPS system should be fitted to each vehicle to allow the Network Control Centre, and possibly Regional Control Centres in the future, to continually track ISU movements and allow response time performance to be monitored. Direct communication links with the Network Control Centre must also be provided. Communication links with the Police must be agreed locally.

The Network Control Centre must keep copies of drainage information, pollution control plans and plans showing location of highway electrical equipment. Each ISU must carry a comprehensive range of equipment to deal with a wide range of emergency situations. The equipment must reflect the needs of the local network. A typical list of equipment to be carried is as set out in the table below.

7.12.1 Minimum Equipment for Motorways

MATERIALS	TOOLS	TM EQUIPMENT (minimum)	INFORMATION
Pot hole repair material	Disc cutter	60 (750mm) Traffic Cones	Route maps and plans
Oil absorbing material	Hand saw and bow saw	15 road danger lamps (sequential flashing)	Generic Risk Assessments
Oil absorbing booms	Manhole lifting keys	Road narrows signs	Method Statements
Carcass disposal bags	Sledge hammer	5No. Keep Right/Left (610) arrows (900mm)	ISU Operations Manual
Lamp batteries	Brushes	2No. Road Closed Sign	Diversion route plans
Marker paint	Shovels	2No. Flooding Signs	GPS
Cutting discs	Safety fence spanners / Stillson	4No. Traffic Light inoperable signs	Contact telephone list
Temporary Fencing	Sharps box	3No. Incident Slow Signs	Availability for future use of Airwaves
Gully seals	Torches	2 No. Diverted traffic signs	
	Drain rods and stoppers	Sandbags (sufficient to anchor signs above)	
	Pickaxe		
	Cable Avoidance Tool (CAT)		
	Task lighting		
	Digital camera		

7.12.2 Minimum Equipment for All Purpose Trunk Roads

MATERIALS	TOOLS	TM EQUIPMENT (minimum)	INFORMATION
Pot hole repair material	Disc cutter	30 (750mm) Traffic Cones	Route maps and plans
Oil absorbing material	Hand saw and bow saw	15 road danger lamps (sequential flashing)	Generic Risk Assessments
Oil absorbing booms	Manhole lifting keys	Road narrows signs	Method Statements
Carcass disposal bags	Sledge hammer	5No. Keep Right/Left (610) arrows (900mm)	ISU Operations Manual
Lamp batteries	Brushes	2No. Road Closed Sign	Diversion route plans
Marker paint	Shovels	2No. Flooding Signs	GPS
Cutting discs	Safety fence spanners / Stillson	4No. Traffic Light inoperable signs	Contact telephone list
Temporary Fencing	Sharps box	3No. Incident Slow Signs	Availability for future use of Airwaves
Gully seals	Torches	2 No. Diverted traffic signs	
	Drain rods and stoppers	Sandbags (sufficient to anchor signs above)	
	Pickaxe		
	Cable Avoidance Tool (CAT)		
	Task lighting		
	Digital camera		

7.12.3 Secondary Response Times

The response time for secondary response is defined as the time elapsed from the request for additional assistance to the Service Provider's control room to the time of arrival on site of the emergency incident by the secondary response. Response times must be as set out in the table below unless stated otherwise in the Service Provider's contract.

Secondary Response	Response Times 04:00-20:00hrs	Response Times 20:00-04:00hrs
Chapter 8 Closure and Diversion Routes – closure to be established in accordance with paragraph O7.2.23 of Chapter 8 (2006) Part 2: Operations.	50 minutes	75 minutes
Silver Command – Command structure is as detailed in Chapter 3.2 of the Network Management Manual. The Silver Command may attend the incident scene and is responsible for formulating the tactics to be adopted to achieve the strategy set by Gold Command.	40 minutes	75 minutes

Secondary Response	Response Times 04:00-20:00hrs	Response Times 20:00-04:00hrs
Bridge/Structural/Pavement Engineer – The bridge/structural/pavement engineer may attend the incident scene and make an assessment of the status of the highway infrastructure, including but not limited to bridges, parapets, safety fencing, road surface, etc. The specialist expert(s) will report and advice on his assessment of the highway infrastructure and possible required action.	60 minutes	90 minutes
HI-AB – Vehicles/equipment, such as HI-AB, with lifting capacity of 1.0 tonne to recover, remove, re-load or make stable loads or obstructions from/on the carriageway.	50 minutes	75 minutes
Mechanical/Suction Sweeper – Vehicles/equipment, which can remove obstructions/spillages from drainage systems.	50 minutes	75 minutes
Gully Emptiers/Drain Jetting/Vacuum Units – Vehicles/equipment, which can remove obstructions/spillages from drainage systems	50 minutes	75 minutes
Electrical Team – The electrical team which consists of electrical operative(s) and all necessary electrical tools to assess, make safe and possibly repair damage to the technical infrastructure along the network.	50 minutes	75 minutes
Mobile Elevated Working Platform – Vehicles/equipment which provides a temporary working platform to assist working at height.	50 minutes	75 minutes
Patching Team – The patching team will be required to undertake temporary surface repairs to allow the carriageway to be opened. Maximum area 4m ² . Permanent works will be carried out as per the Service Provider's contract.	50 minutes	75 minutes
Vehicle Restraint System Repair team – The Vehicle Restraint system repair team which consists of operatives, fencing rig / equipment will be required to make safe and undertake immediate repairs as required.	50 minutes	75 minutes

Secondary Response	Response Times 04:00-20:00hrs	Response Times 20:00-04:00hrs
Fuel Spillage Team – Vehicles/equipment/resources, such as spill kits, which are able to make safe medium sized fuel spillages (petrol and diesel, up to 200 litres).	50 minutes	75 minutes
Specialist Chemical Recovery Team – Vehicles/equipment/resources, such as tankers, which are able to safely remove hazardous materials, such as oils, acidic solutions, caustics, tars, bitumens, heavy sludges.	90 minutes	150 minutes
Parapet breaches – Vehicles/equipment/resources which can make safe and possibly immediately repair parapet breaches.	90 minutes	150 minutes
Cranes (capacity > 10 tonne) – Vehicles/equipment/resources which can safely remove large goods vehicles (LGVs), obstructions and loads.	2 hours	180 minutes
Small Pumps (≤ 4") – Equipment to assist in the removal of large spillage and floods	50 minutes	75 minutes
Large Pumps (> 4") – Equipment to assist in the removal of large spillage and floods	90 minutes	150 minutes
Generator and Enhanced Task Lighting (> 3kW) – Equipment which can provide an isolated power supply and provide enhanced task lighting	50 minutes	75 minutes
Winches (> 1 tonne) – Equipment to assist in the removal of obstructions / loads.	50 minutes	75 minutes
High Pressure Water Hose – Equipment to assist in the removal of obstructions / spillages etc by water jetting.	90 minutes	150 minutes
Tipper Lorries/Skips – Vehicles/equipment/resources to assist in the removal of debris, spilled loads from the incident to tip	50 minutes	75 minutes
Lorries with Crane Attachments (6.0T) – Vehicles/equipment/resources, with a 6.0 tonne capability, which can safely remove obstructions and loads.	50 minutes	75 minutes
Compressor (> 100 PSI) and Tools – Equipment/resources to undertake any immediate repairs in making safe the highway infrastructure	50 minutes	75 minutes

Secondary Response	Response Times 04:00-20:00hrs	Response Times 20:00-04:00hrs
Tank Matting – Specialist equipment to allow access over verges and soft estate	50 minutes	75 minutes

This listing is not exhaustive and any amendments or additions must be as prescribed in the Service Provider's contract or in written agreement with the Service Manager.

7.12.4 Incident Clearance

Service Provider must record incident clearance times for specified types of incidents. Service Provider must look for continual improvement and national rollout based upon 'actual data' from the new Area 10 Managing Agent Contractor (MAC) contract.

The incident clearance time must be measured as follows:

- Time elapsed from the completion of emergency traffic management or Chapter 8 (2006) to the time of the end of the incident cleared (road open, possibly permanent repairs outstanding).
- Time elapsed from the handover to 'HA led' incident to the time of the incident cleared (road open, possibly permanent repairs outstanding)
- Time elapsed from vehicle recovery completed to the time of the incident cleared (road open, possibly permanent repairs outstanding)

The table below provides baseline incident clearance times which are designed to be used as incident clearance times targets.

Type of incident	Clearance time
Hand sweeping only	10 minutes
Mechanical sweeping	15 minutes
Sweeping and large debris	20 minutes
Minor infrastructure repairs	2 hours
Major infrastructure repairs	4 hours
Carriageway resurfacing	8 hours
Serious chemical spillage	12 hours

7.13 Health & Safety

7.13.1 Introduction

Most organisations operate within cultures where health and safety is an integral part of the work regime. Whilst the urgency of an incident may entail some risk taking, it is vital to ensure safe systems of work for the responding agencies and their personnel. Part 1 of the Network Management Manual addresses the management of health and safety.

7.13.2 Incident Support Units (ISUs) and Traffic Management

Risk analysis and management is an integral part of the provision of the Service Provider's Incident Support Unit (ISU) service. The Management of Safety at Work Regulations of 1992: HSE Approved Code of Practice 1992 (revised 1999/2000) requires risk analyses to be regularly carried out and to include for the safety of the public and those nearby.

The Service Provider must ensure generic risk assessments are carried out in advance for all those activities to be undertaken by the ISU crews and a process must be in place for monitoring compliance with the legislation. A dynamic risk assessment must also be undertaken, on arrival at the scene, prior to the tackling of an incident.

The complexity of traffic management arrangements varies from incident to incident, but the primary objective is always to maximise the safety of the workforce and the travelling public.

Guidance relating to the health and safety aspects of the setting up, maintenance and removal of traffic management arrangements is given in "Guidance for Safer Temporary Traffic Management" published on behalf of the Highways Agency, the County Surveyors' Society (CSS) and the Health and Safety Executive (HSE) and "Traffic Signs Manual Chapter 8, 2006; Part 1 – Design & Part 2 - Operations".

Incident Support Units must have a crew of at least two operatives whenever deployed operationally. ISU crews must be adequately trained in all the procedures needed to deal with the incidents they are required to attend, and evidence of that training must be demonstrated. The aim of the training, in addition to passing on the techniques to use, is to make sure that 'best industry practice' is passed on to new staff.

Each ISU operative must possess a level of competence at least in accordance with the requirements of Sector Scheme 12B. Details of this scheme can be found at the United Kingdom Accreditation Service website, www.ukas.com. In addition, for equipment included in section 7.13 above, each ISU operative must possess a level of competence at least to the appropriate 'best industry practice' such as Construction Skills Certification Scheme, Construction Industry Training Board, Sector Scheme.

7.13.3 Hazardous Materials

Where hazardous materials are involved, the ISU must not approach the spillage or enter the incident scene. The Service Provider must alert the Fire and Rescue Service and Environment Agency immediately through their control room, who must in turn alert the RCC or PCO. Mobile phones and radio communications will not be used near potentially flammable spillage. The ISU must provide as much additional information as possible without approaching the substance. The ISU will also look to confirm the location of drainage outfalls, water courses and other potential risks to the environment.

7.13.4 Chemical, Biological, Radiological or Nuclear (CBRN) Substances or Material

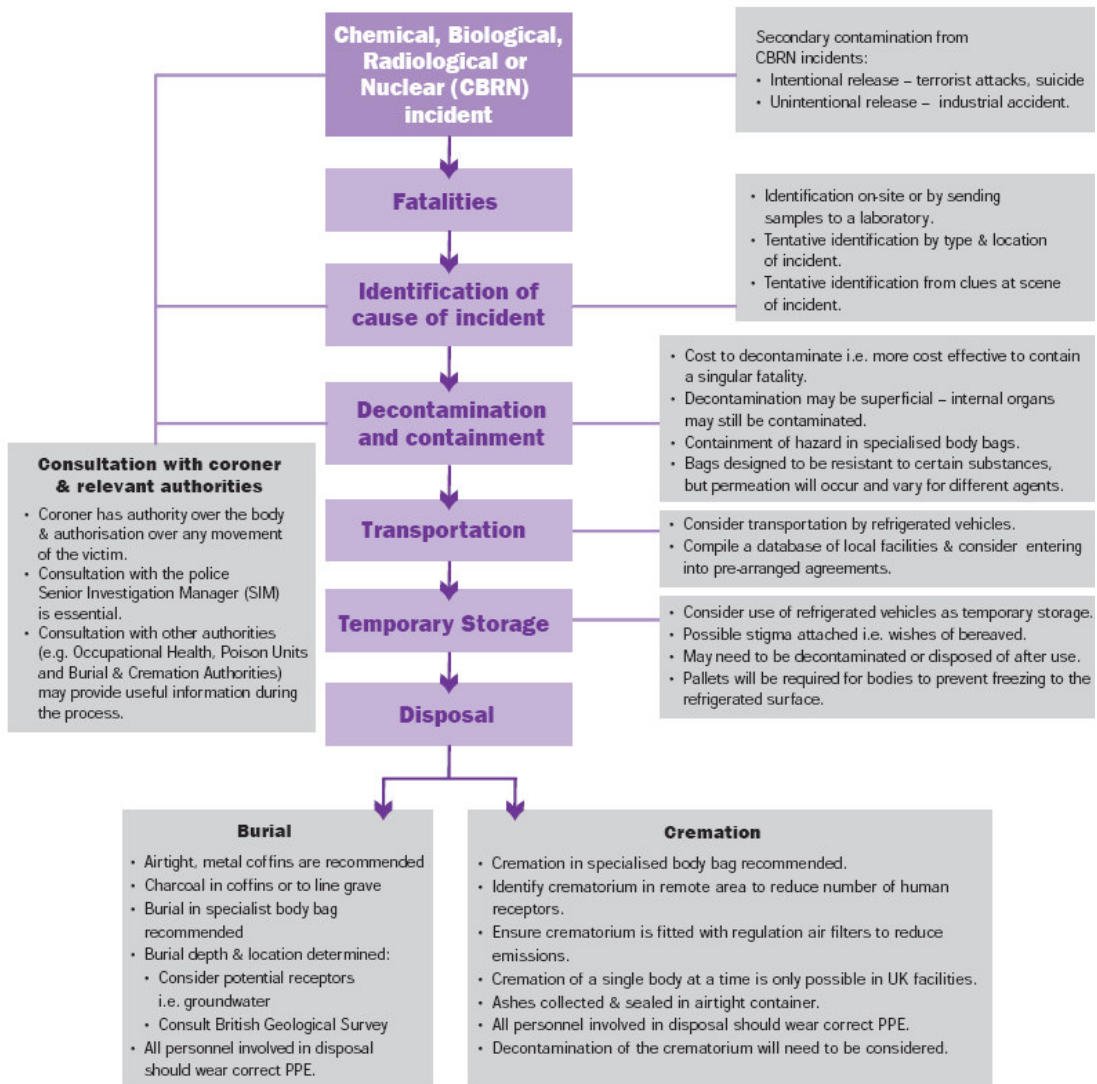
Dealing with fatalities may present physical, health and environmental risks. Persons at and near to the scene and other key facilities will be particularly at risk. The degree of risk could be particularly severe with an incident involving a chemical or biological release.

The Home Office has issued guidance for Local Authorities, and others with responsibilities for protection of the public (such as Service Providers), to develop practical strategies for dealing with chemical, biological, radiological or nuclear (CBRN) substances, whatever their cause. The guidance provides an agreed set of principles and a shared understanding of the key issues that may need to be addressed, which the Service Providers must include within their contingency plans.

Decision-making will always be complex. Much will depend on the nature of the containment, how much has been released, factors such as weather conditions and the nature of the environment in which the release has occurred or, in a terrorist incident, the effectiveness of delivery and any action that has already been taken to minimise it. Wherever possible victims will be decontaminated on site, but it is recognised that it may be necessary to remove victims from the area of greatest contamination.

A generic model for managing a CBRN incident is below for information.

Process Management of a CBRN Incident



7.14 Hazardous waste

7.14.1 Introduction

There are four sets of regulations applicable to England and Wales that came into force on 16 July 2005:

- The Hazardous Waste (England and Wales) Regulations 2005
- The Hazardous Waste (Wales) Regulations 2005
- The List of Waste (England) Regulations 2005
- The List of Waste (Wales) Regulations 2005

These are referred to as Hazardous Waste Regulations and List of Waste Regulations. These:

- Implement a definition of hazardous waste into domestic legislation.
- Require producers of hazardous waste to notify their premises (with some exceptions).
- End the requirement to pre-notify wastes to the Environment Agency, as previously required under the revoked Special Waste Regulations.
- Ensure safe management of hazardous wastes.
- Provide cradle-to-grave documentation for the movement of hazardous waste.
- Require consignees to keep thorough records of hazardous waste and provide the Environment Agency with quarterly disposal and recovery information.

7.14.2 Hazardous Waste Regulations

Hazardous waste is currently waste with one or more hazardous properties that are hazardous to health or the environment. The Hazardous Waste Regulations defines hazardous waste on the basis of:

- (a) Any waste listed as hazardous in the *List of Waste Regulations*.
- (b) Any specific batch of waste that the Secretary of State determines is exceptionally to be classified as hazardous.
- (c) Any specific batch of waste produced in Wales, Scotland or Ireland that the Welsh Assembly Government, the Scottish Executive or the Northern Ireland Department of the Environment respectively determines as hazardous will also be treated as hazardous waste in England.

The Secretary of State can also make additional types of waste as hazardous by virtue of making regulations under section 62A of the Environmental Protections Act 1990.

With the above regulations in place it should be known if a vehicle is carrying hazardous waste. If so it can aid the first responders to quickly identify the specific or generic hazards of the material(s) involved in the incident and protect themselves and the general public during the initial response phase of the incident. For the purposes of this section, the “initial response phase” is that period following arrival at the scene of an incident during which the presence and/or identification of dangerous goods is confirmed, protective actions and area containment are initiated, and assistance of qualified personnel is requested. It is not intended to provide information on the physical or chemical properties of dangerous goods. It should also not be considered as a substitute for emergency response training, knowledge or sound judgement.

7.14.3 Hazardous Waste Identification and Test Methods

The first responder to the scene should assess the foreign material and determine whether it presents a safety risk in its current location and manage it appropriately. Suspected hazardous materials should be treated with extreme caution, whether spilled or contained. Any information that

can be gathered without risk to the personnel at the scene will be passed to the Regional Control Centre and/or the Service Provider's control room. If foreign material presents a safety risk and cannot be moved manually, then assistance must be requested via the RCC and/or Service Provider's control room from the Fire and Rescue Service, Environment Agency and specialist responders.

There are certain hazardous materials that, once made safe at the scene, still require a period of containment before being recovered, e.g. oxyacetylene cylinders. The Fire and Rescue Service will remain responsible for the hazardous materials and the containment process. This will typically require exclusion zones resulting in partial or full road closures depending on the substance and its state. The Fire and Rescue Service will take advice from their technical contractors or from the relevant industry specialists.

The test methods serve to give specific meaning to the definitions given in Hazardous Waste Regulations. The methods to be used are those described in Annex V to Directive 67/548/EEC, in the version as amended by Commission Directive 84/449/EEC, or by subsequent Commission Directives adapting Directive 67/548/EEC to technical progress. These methods are themselves based on the work and recommendations of the competent international bodies, in particular the OECD incidence.

7.14.4 Hazardous Waste Clean Up and Disposal

The Service Provider must consider the issue of waste materials, and arrangements must be made in advance to establish a procedure for dealing with disposal of all types of waste material in a sensitive manner. It may be necessary to deploy specialist waste companies to rapidly remove and dispose of all hazardous, clinical and human waste materials and waste matter, animal carcasses and the like arising from incidents and other emergencies as required. Significant spills may involve not only the hazardous materials (HAZMAT) service but also related environmental protection authorities from the Environment Agency. Therefore such companies should be identified in advance, to reduce response times when such incidents occur.

The duties of the Incident Support Unit include removing from the network and disposing of debris and waste material and animal carcasses of any shape or size which could be a hazard or distraction to road users. Individual items to be removed should not exceed 50 kg and exclude any hazardous, clinical and human waste materials and waste matter. Duties are limited to the removal and disposal of a maximum of 250 kg of waste in total at any one incident site. Waste materials outside these categories will be removed and disposed of using Service Provider's specialist waste services.

Service Providers must have capabilities for dealing with hazardous materials that have been made safe by the Fire and Rescue Service. The Service Provider will also be responsible for recovering any substances the Fire and Rescue Service have used to contain and stabilise hazardous materials. Where there is an environmental risk, the Service Provider must contact the Environment Agency for advice and in some cases, a response from Environment Agency officers. In some cases, the Service Providers will be unable to recover the substance due to its particular nature (e.g. explosives, gas cylinders). In these cases, support from additional responders must be requested.

Live animals must be treated in a manner appropriate to the risk that they present whilst avoiding unnecessary suffering. The Highways Agency and Service Providers must coordinate and arrange for their removal and request the assistance of specialists (such as vets). Specialist services (e.g. firearm units) will be requested from the police if the live animal presents an immediate threat to public safety.

Police will arrange for the removal of body tissues from the scene of incidents in accordance with Coroner instructions. The Highways Agency and Service Provider must clear the carriageway of residual body tissues (those not of interest to the police for evidential purposes) having due regard to biohazard and current contractual arrangements.

7.15 Reporting & Recording**7.15.1 Introduction**

The Highways Agency and their Service Providers are not an investigatory body and do not, therefore, as a core function seek out evidence of offences. The nature of work will, however, mean that both Highways Agency and Service Provider staff will become witness to events that may result in criminal proceedings. There will also be circumstances when Highways Agency equipment will record events, either by way of audio and/or visual formats that become relevant in proceedings. The Highways Agency and Service Providers must cooperate with the police in ensuring that any evidence secured during its operations is made available to investigators. This will include the provision of witness statements from their staff.

In order to comply with the ACPO Road Death Investigation Manual, police officers investigating incidents involving (possible) fatalities may require detailed technical evidence from Highways Agency and Service Provider staff. This could include details of road infrastructure and how it has been managed, e.g. gritting in winter.

7.15.2 Reporting

Effective communication between the Service Provider and the other responders is imperative to ensure that the Highways Agency has accurate and up to date reports on incidents affecting traffic flows on the network. Throughout the incident, the Service Provider must continuously update the RCC on the status of the incident. The Service Provider must report to the RCC at the following points:

- Incident reported
- Incident verified
- Response dispatch, both ISU and secondary response
- Response arrival, both ISU and secondary response
- Completion of ETM, lane closures and diversion route implementation
- Handover(s), e.g. from police to Service Provider, from vehicle recovery to Service Provider
- Completion of recovery by others
- Completion of incident clearance, e.g. opening of lane(s)
- Completion of traffic restrictions

The Service Provider must liaise with the NTCC/NILO during major/critical incidents and update them with the incident details and anticipated or actual consequences, at least on an hourly basis.

7.15.3 Recording

The effective analysis of incidents and accurate assembly of information is essential if long term monitoring is to be meaningful and improvements in achievable performance. The Service Provider must keep a log of action taken for all incidents to which ISUs are deployed including times, date, location and nature of incident. This will provide a database of incident locations, response times and duration which can be used to undertake an ongoing analysis to monitor performance, optimise the use of ISUs and provide for the effective management of incidents on the Highways Agency's network. The Service Provider must complete and submit the incident data capture sheet as per Annex 7.8.10 and as prescribed in the guidance notes.

7.16 Incident Investigation

7.16.1 Responder Roles and Responsibilities

Any incident scene involving a fatality, serious injury or criminal act will be under the jurisdiction of the Police, until they hand it over to the Service Provider. At all times, the Incident Support Unit and all personnel must follow the instructions and directions given by the Police, including arrangements for reaching the site. All personnel attending an incident scene must report immediately to the senior Police officer at the scene, and obtain Police agreement before proceeding with any investigation and comply with any instructions given by the Police. The Police have the power to open or close a road affected by an incident.

Police incidents can be viewed as one of two eventualities:

- Crime scene including fatalities which are treated as murder scenes, this ensures the maximum amount of evidence is collected.
- Scenes where public order or safety are at risk (HAZMAT clearance, serious infrastructure damage etc.)

Crime scenes will be handled almost exclusively by the police and can be time consuming. Public order or safety will often include other responders, including Highways Agency and Service Providers but will be closely managed by the police.

The scene management phase of an incident is crucial to the police. During this phase, the police work to six key principles which are critical to the investigation. They include:

- Conducting an initial assessment (incorporating SAD CHALETS);
 - Survey
 - Assess
 - Disseminate
 - Casualties – approximate number of dead, injured and uninjured
 - Hazards – present and potential e.g. fuel spillage, debris, weather conditions, terrain,
 - presence of gases, chemicals, fire or the danger of explosion
 - Access – best routes for emergency vehicles, parking, turning points, routes blocked and suitable rendezvous points
 - Location of incident (if it is not easily identifiable, as in isolated areas, identifiers such as landmarks or road junctions should be used to pinpoint the site)
 - Emergency services – present and required
 - Type of incident – brief details e.g. of number of vehicles or buildings involved
 - Safety – all aspects of health and safety and risk assessment must be considered by all staff working at or close to the scene.
- On scene safety and preservation of life;
- Preservation of the scene;
- Securing material and identification of witness(es);
- Identification of victim(s); and
- Identification of potential suspect(s).

Preserving the scene maximises the chances of recovering physical material ensuring it is not damaged, disturbed or contaminated. The Traffic Officer and Service Provider will not typically be given access unless accompanied by police, however Traffic Officers may be called upon to assist with securing the scene provided the tasks allocated do not exceed their legal powers².

² Taken from Section 3.3.3 Preserving the Scene (ACPO Road Death Investigation Manual 2007), page 34.

Police – managing all aspects within a crime scene. Additional resource from within the police service is often deployed.

HA Regional Control Centre (RCC) – ongoing facilitating role although the Roads Policing Senior Investigating Officer or dedicated scene manager(s)³ will facilitate the crime scene.

Traffic Officer – focussing on scene protection, traffic management and welfare.

Service Provider – supporting HA and police resources where possible.

³ In cases where there are complex or multiple scenes, the RP SIO may appoint a dedicated scene manager or managers. Section 5.1 (ACPO Road Death Investigation Manual 2007), page 60.

7.16.2 Evidence Collection*Collection of evidence by Service Providers*

1. Investigation at the Incident

Information to collect at the time of the accident must include but not be limited to:

- A photographic record of the site (but not of victims).
- Detail photographs (failed components, any unusual features, items with maintenance or design implications).
- Traffic details, traffic management, details of the approach to the site (including photographs and preferably a video record).
- Weather conditions (at the time of and prior to the accident).
- Details of unusual aspects of the incident.
- Malfunctioning highway equipment (e.g. lighting, signs).
- Winter maintenance operations in progress, if appropriate.
- Retention of damaged/failed components that may benefit further investigation.

2. Further Investigation

Information to gather after the incident should include but not be limited to:

- Details of the road layout and alignment design.
- Condition of the highway (including skid resistance tests etc. if appropriate), and samples of the surface material and items such as bolts from adjacent undamaged safety fencing
- Records of earlier highway inspections
- Testing of any components involved if appropriate (e.g. safety barrier)
- Copies of press reports
- Police records

Collection of evidence by Police (with Fire and Rescue Service resource)

The police will collect evidence from the scene to support future prosecutions and to service HM Coroners. This could be through:

- Debris collection
- Photographing the scene
- Other visual recording of scene details
- Surface marks on the road
- Witness statements (typically details are taken and statements collected later)
- CCTV footage
- Finger tip searches
- Weather reports and observations
- Body fluids on the road
- Other items gathered from the scene

There may also be an investigation of areas beyond immediate scene including structures adjacent to the road, embankments, down stream of the incident.

In some circumstances additional evidence can be collected after the incident has been cleared, this includes:

- Structural damage
- Road layouts

It is, however, important for the police that all evidence is collected from the scene before recovery starts.

Evidence collected by Collision Investigation Units may include:

- Location and measurement of marks and debris at the scene
- Collision positions and location of vehicles and bodies
- Extensive forensic photography
- Matching of vehicle damage to marks on other vehicles
- Vehicle condition (seatbelts, airbags)
- Skid tests on road surface

All of these aspects can take considerable time but it is essential that a thorough investigation be executed.

Evidence collection

This section provides an indication of what the Service Providers will be required to assist the Highways Agency and RCC's with. Current lists that detail the range of evidence that can potentially be requested are available in the Highways Agency Road Death Investigation Guidance (HA RDI Guidance) (revision expected Spring 2009) appendices 1-3 and in the CD version of the Road Death Investigation Manual (RDIM) (2007), under the additional documents folder in the 'Highway Authority Docs' file.

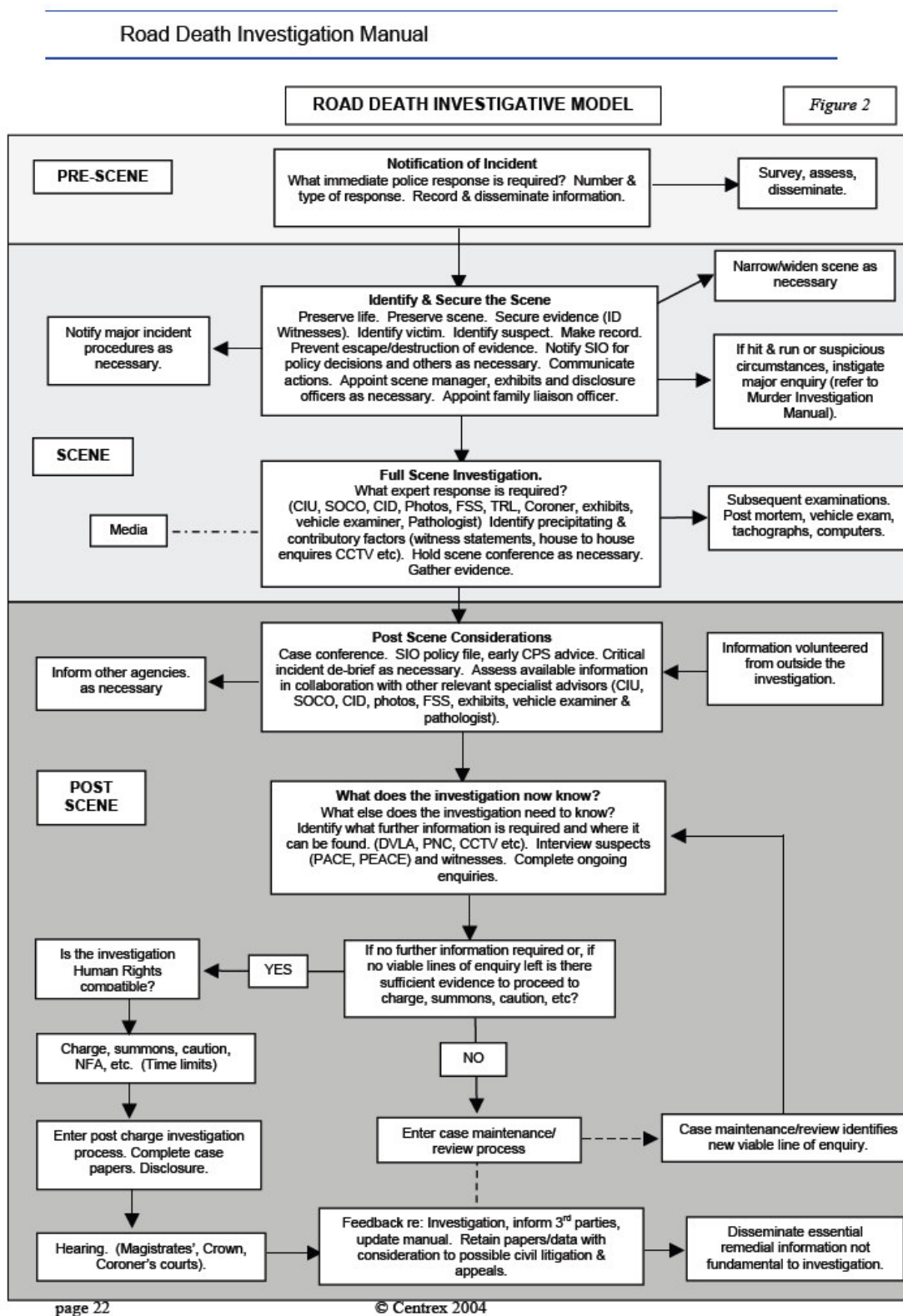
Table 7.16A (an updated version of that included in the Highways Agency and Association of Chief Police Officers – The Network Operations National Guidance Framework Second Edition – March 2005) sets out the process of evidence collection, capture, management, storage, retention and disposal.

Table 7.16A Evidence collection and management

How is evidence collected?	The Highways Agency is not an investigatory body and does not, therefore, as a core function, seek out evidence of offences. The nature of its work will, however, mean that HA staff and the Service Provider will become witness to events that may result in criminal proceedings. There will also be circumstances when HA equipment will record events, by way of audio and/or visual formats, that become relevant in criminal proceedings. The HA will cooperate with the police in ensuring that any evidence secured during its operations is made available to investigators. This will include the provision of witness statements from HA staff. There will be occasions when investigatory bodies will seek assistance from the HA in using its equipment with a view to securing evidence. The Regulation of Investigatory Powers Act controls such activity. The HA will make its facilities available to such bodies whenever possible and, in particular, will provide primary access to the police to its CCTV system for the purpose of criminal investigation.
Capturing evidence	HA staff are likely to become aware of evidence in the following circumstances: <ul style="list-style-type: none"> • on-road - by patrolling HA Traffic Officers or ISU's through direct observation in attending incidents or through observing incidents which provide evidence of an offence • CCTV - through observing via monitors or recordings circumstances which provide evidence of an offence • telephone - by capturing audio information from telephone calls that are directed to the RCCs.

Evidence management	<p>In the above circumstances evidence may be captured in the following ways:</p> <ul style="list-style-type: none"> • Direct observation - will require staff to record evidence in writing in a pocket book or other official format • CCTV - by recording the event or, if not possible, by making a written record of the event in a manner similar to the above • Telephone lines - by recording the event. If recording is not possible, then by making a written record of the event in a manner similar to the above. <p>Staff, whether in the RCCs or on patrol, may not be aware of the importance of what they have observed. Staff should apply good judgement and common sense to what is seen and heard when considering what may be evidence. It is better to capture details of an event that are not subsequently needed than to risk losing important information. Evidence must be recorded as soon as is reasonably practicable and its integrity must be protected at all times if it is to be of use. The Criminal Procedures and Investigations Act requires that all 'material obtained in the course of a criminal investigation' is disclosed to the defence in a court case. HA staff should notify the RCC supervisor as soon as practicable if they believe that they are in receipt of evidence. The supervisor will liaise with the police to ensure that they are aware of what is available and that arrangements need to be made for the evidence to be included in any case preparation.</p> <p>The recording of a scene or an individual piece of evidence by any means, whether digital, analogue, film or paper based, should only be undertaken for official and authorised purposes. An auditable record should always be maintained.</p> <p>No copies of evidential material will be made without the authority of a designated manager from the incident's lead organisation.</p>
Storage of evidence	<p>The HA will provide facilities for the initial storage of evidence in the original format in which it is obtained. It will be responsible for ensuring that access to storage is restricted to ensure that the integrity of evidence is maintained. Day to day management of storage facilities will be the responsibility of supervisors in the RCC. (HA storage requirements will be the subject of detailed internal procedures published elsewhere).</p>
Retention and disposal of evidence	<p>The advice of the police will always be sought with regard to retention and disposal of anything that may be, or has been, used as evidence.</p>
Evidence regarding the management of HA roads and facilities	<p>In order to comply with the ACPO Road Death Investigation Manual (2007), Police Officers investigating incidents involving death on the road may require detailed technical evidence from HA staff. This could include details of road infrastructure and how it has been managed, e.g. gritting in winter. It is not the role of the RCC staff or HA Traffic Officers to provide this information. Any requests to provide such details must be forwarded, without delay, to the relevant HA Area Manager who will coordinate the HA response. The types of documents that could be requested are in Appendices 1-3 of the HA RDI Guidance (revision expected Spring 2009) and on the CD version of the ACPO RDIM in the additional files folder under 'Highway Authority Docs'.</p>
Statements regarding other evidential matters	<p>For circumstances other than the above, where the police require a formal statement from HA staff to support a criminal case or the retrieval of evidence from the Highways Agency, this should be co-ordinated through HA line managers.</p>

Table 7.16B shows for information a generic model for a road death investigation from the RDI manual (2004)⁴.



⁴ This table is not included in the RDIM (2007). Some terminology has altered and some new techniques have been incorporated in to the process. However, it still provides a useful insight in to the RDI process.

7.16.3 Extracts taken from the Road Death Investigation Manual (RDIM 2007)

This section covers what evidence the Police will be looking for when a road death occurs.

The Police have a duty to conduct thorough investigations to establish the circumstances which have led to a road fatality and subsequently discharge their responsibilities to the HM Coroner. The Police will investigate any fatal collision from the viewpoint of it being an 'unlawful killing' until it is proved otherwise.

The starting point of the investigative evaluation will be establishing: what is known and unknown; consistencies and inconsistencies and any conflicts. To answer these points the police will consider the Why, When, Where, How, Who and What during the investigation.

The main objectives of a collision scene investigation involve:

- "Identifying, securing and recording the physical outcomes relating to the collision;
- Obtaining information at the scene, which may not be available later;
- Testing hypotheses; and
- Identifying material to be seized for examination at a later date".

Material, i.e. evidence, is defined as:

"material of any kind, including information and objects, which is obtained in the course of a criminal investigation and which may be relevant to the investigation. Material may be relevant to an investigation if it appears to an investigator, or to the officer in charge of an investigation, or to the disclosure officer, that it has some bearing on any offence under investigation or any person being investigated, or on the surrounding circumstances of the case, unless it is incapable of having any impact on the case."⁵

As well as the collection of material for the investigation, the police will record the scene. The methods that they can use for this are:

- "A written record;
- Formal scene plans (these can be undertaken by the collision investigator);
- Stills photography;
- Video photography;
- Three hundred and sixty degree photography;
- Aerial photography;
- Virtual systems;
- Surveying equipment, for example, theodolite equipment with or without global positioning systems (GPS)."

The purpose of the investigation is to ultimately be in a position to clarify the circumstances of the incident and a sequence of events. The focus of the investigation will be on human, vehicle and environmental factors. Examples of human, vehicle and environmental factors include, but are not confined to the following.

Human Factors

- Alcohol and/or drugs.
- Vehicle occupant restraint use – were restraints correctly worn?
- Fatigue.

⁵ taken from Criminal Procedure and Investigations Act 1996 (CPIA)

- Bad or injudicious driving.
- Distraction of the driver, road user, pedestrian, e.g., through use of a mobile phone.
- Health and eyesight issues.
- Training and competence of the driver or road user.
- Other road user or pedestrian movements.

Vehicle Factors

- Roadworthiness and general condition.
- Suitability of vehicle for use or location, e.g., moped on a motorway.
- Potential design fault, e.g., an inbuilt blind spot.

Environmental Factors

- Road condition, e.g., condition of the road surface.
- Road geometry, e.g., curvature and grade.
- Roadside protection, e.g., purpose and condition of the central reservation barriers.
- Signage, lighting, automatic traffic signals.
- Weather conditions at the time of the collision.

While the Roads Policing Senior Investigating Officer has overall responsibility for the scene, the collision investigator is the one responsible for conducting a thorough examination. The collision investigator may decide to employ any of the methods listed below when conducting a scene examination:

- “Locating, measuring and describing marks and debris left at the scene.
- Locating and measuring post-collision positions of vehicles and bodies.
- Photographing marks, debris, bodies, post-collision positions of vehicles, damage to vehicles and street furniture. In some circumstances, this may be undertaken by specialist photographers.
- Attempting to match vehicle tyres to tyre marks on the road.
- Examining the condition and operation of traffic control systems and streetlights.
- Examining and noting or photographing the position of control systems within the vehicles, eg, light switches, gears and the condition of seatbelts and airbags.
- Examining the vehicle to identify whether a collision or journey data recorder is fitted to the vehicle. The investigator should record which areas of the vehicle have been examined and whether or not a data recorder has been found. Recording those areas searched and the fact that a data recorder was or was not found may become relevant if a claim is later made that a data recorder was fitted and material from this device is used as a defence.
- Establishing what type of data recorder is fitted to the vehicle and how material from it may be retrieved and preserved.
- Examining the vehicle to establish whether any devices are fitted, and if so of what type, location and whether they were in operation at the time of the collision. Examples may include satellite navigation systems, engine management systems, airbags or anti-lock braking systems (ABS). Again, consideration should be given to how this device and any material it may contain can be preserved as evidence.
- Examining the condition of vehicles and relevant street furniture. Where evidence permits, attributing physical marks to the vehicle or object which made them.
- Undertaking skid tests to establish coefficient of friction values between the road surface and vehicle. This will usually apply to tyres, but this technique can be used on bodywork if the vehicle overturned and slid on its roof.
- Recovery of any tachograph charts and related material”.

In relation to vehicle factors, the vehicle examiner is tasked with establishing the pre-collision mechanical condition of the vehicle (so far as it is possible to do so), and considering the likelihood of a vehicle-related factor having caused or contributed to the collision. “Additional tasks involved with vehicle examination include:

- Obtaining forensic material from the vehicles involved;
- Establishing the pre-collision position of controls, switches and other components which may have had an influence on the position or movement of the vehicle prior to the collision;
- Recording details of the position and extent of any damage in order to ascertain the immediate pre-impact positions of vehicles and objects relative to each other;
- Identifying whether any devices have been fitted to the vehicle, for example, engine management systems, satellite navigation systems, airbags or anti-lock braking systems (ABS), and whether they contributed to the collision or hold material that would be useful to the investigation;
- Identifying any vehicle design implications and ascertaining if any defects may have caused the collision or have a potential to affect the overall safety of similar vehicle models. This may require checking vehicle maintenance records for vehicles involved in a fatal collision and, if necessary, reviewing records for vehicle fleets in cases of potential corporate manslaughter, in order to identify any system failures”.

Duties and powers of Highway Authorities

The following is taken from the RDIM (2004) but is still particularly relevant guidance.

The highway authority has a wide range of duties and powers contained within a number of Acts of Parliament and regulations. In addition, national and local codes of practice promote good practice.

- Statutory duties are absolute and obligatory, i.e. they must be undertaken. An example would be: the highway authority’s duty to maintain the highway under Section 41 of The Highways Act 1980. Further duties are contained within legislation such as: The Road Traffic Regulation Act 1984, The New Roads and Street Works Act 1991 (NRSWA) (Codes of Practice on the reinstatement of road excavations).
- Powers can be exercised when deemed appropriate. However, if a power is exercised, e.g. by undertaking highways improvement then there is a duty to maintain the resultant works.

When a collision has occurred and highway involvement is alleged then the highway authority should be able to demonstrate it took reasonable measures to ensure the safety of the road user was not compromised. It should be noted that when determining whether reasonable measures have been effected on any particular road, it is necessary to consider the character of the road and the nature of the traffic using it, i.e. not all roads are required to be maintained to the same standard. The prior knowledge held by the highway authority on a road is also of great significance, e.g. its collision record, whether any complaints had been received from the public or local councils, and when inspections and surveys of the road have been undertaken and their findings.

Highway authorities are under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow and ice. In *Goodes v East Sussex County Council (2000) RTR 366 HL*, the House of Lords stated ‘that a highway authority’s duty under section 41(1) of the Highways Act 1980 to “maintain the highway” was an absolute duty to keep the fabric of the highway in such good repair as to render it reasonably passable for ordinary traffic at all seasons of the year without danger caused by its physical condition, but did not include a duty to prevent the formation of ice or to remove the accumulation of snow on the road ...’

An in-depth investigation into the performance of the highway authority will typically seek answers to the following key questions:

- Were the policies, procedures and practices developed by the highway authority reasonable and well considered, when taking into account statutory duties, powers, and national and local best practice?
- Were the policies, procedures and practices developed by the highway authority consistently implemented?
- Did the highway authority act reasonably in response to all of the pertinent information it had available?

In order to answer the above questions, it is necessary to secure very specific information from the highway authority. This is an area where specialist assistance can prove extremely useful in developing detailed lists of documents and information to be sought and secured from the highway authority and other agencies. Securing information from a highway authority will often take time, so it is vital that the request to the highway authority is accurate, well considered and timely. Four distinct groups of documentation can be identified.

- High level, general policy statements – e.g. “A County Council will actively support the safe movement of traffic through the County”. Such statements are typically contained within the authority’s Local Transport Plan, public service leaflets.
- Specific local maintenance policies and standards – e.g. “the highway grass will be cut 4 times per year” or “any pothole reported by the public will be repaired within 24 hours”. Such information is typically contained within the authority’s Highway Maintenance Plan, Winter Maintenance Plan, Street Lighting Plan, Road Safety Plan.
- Authority Procedures – e.g. “skid test survey results will be analysed within one month of receipt”; and Programmes of Work/Prioritisation of Work – e.g. the application of policies set to develop a resurfacing, or Collision Investigation and Prevention works program. Such information is typically found in quality procedures, internal memorandums, procedure files and manuals etc.
- Works Records – e.g. works orders, invoices, work sheets, duty logs, diary entries, instructions to contractors/consultants; Inspection Records – e.g. inspection logs/print outs; and Customer Care Records – e.g. call and correspondence logs (including out-of-hours logs).

Contracts with agents and either term or specialist contractors may also be pertinent to all four of these groups of documentation.

For the types of documents that could be requested, full lists are available in Appendices 1-3 of the HA RDI Guidance (revision expected Spring 2009) and on the CD version of the ACPO RDIM in the additional files folder under ‘Highway Authority Docs’. The lists are set out under three scenarios, circumstances in which:

- (i) vehicles have skidded on frost or ice;
- (ii) vehicles have collided on a relatively new surface, and the surface is thought to be a contributory factor; or
- (iii) a single vehicle collision on a rural bend where the vehicle has left the carriageway.

It should be noted that in the request for some documentation it may be that a 3 to 10 year history is required as part of the investigation/location in question.

Analysis of the documentation and information obtained is obviously the next stage and the use of specialists (such as TRL) for this function is recommended. Typically, a specialist will be able to offer the option of: a preliminary verbal observation on the performance of the highway authority based on a brief assessment of the information obtained; a letter of advice on the key highways issues/the performance of the highway authority; and ultimately a full technical report.

7.16.4 Reporting of incidents

The effective analysis of incidents and accurate assembly of information is essential if long term monitoring is to be meaningful. Incident reports leading on to appropriate levels of investigation are the basis for all further analysis. The Service Manager should be consulted for the appropriate procedure for reporting incidents.

The Highways Agency requires incident reports for trunk roads and motorways in England to be reported on the web based Accident and Incident Reporting System (AIRSweb), and it may be considered good practice to carry out these measures on all classes of road; see "Guidance For Safer Temporary Traffic Management", paragraph 5.4.21 and Appendix C.

The police must be informed of all road accidents which involve an injury occurring on that section of highway open to public use and, on behalf of HM Coroner of any deaths occurring on site.

Under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR), basic reports, using form F2508, are required by the HSE for certain categories of accident and incident. These are not required for accidents unless they are caused as a result of the works.

7.16.5 Incident Management System

There is a statutory requirement on Service Providers to record and report incidents under RIDDOR 1995 and Section 25 of the Road Traffic Act 1972 needs to be augmented by the creation of a management tool for the project which records all site incidents, including particularly those which are traffic management related.

This incident management system needs to incorporate a feature which will identify unexpected levels or categories of incidents, and this will facilitate early action to ameliorate any unsafe features in the project. In England, for works on the trunk road network, there is requirement for service providers to employ a dedicated Traffic Safety and Control Officer (TSCO) under the terms of the contract provides a first line of reporting to assist in this procedure. The appropriate Service Manager should be consulted for works on other roads.

The incident management system should include:

- a formal reporting system;
- provide review meetings;
- establishing the person who has responsibility for record keeping;
- an operational structure; and
- outline contingency plans.

Further issues concerning incident management are considered in Appendix C of "Guidance for Safer Temporary Traffic Management" (CSS/HA/HSE 2002); see Section 13.7, References.

7.17 Managing & Identifying Canine Fatalities

Service Providers are required to have at least one microchip scanner available for use at depots and must ensure their staff know how to use it correctly.

The following processes must be followed when canine remains are found on the Network.

- Identification information must be collated using the Identification of Canine Fatalities form ((included at Annex 7.17.1) and a search must be made for a collar and disc at the site.

Where the owner's details are found on a collar and/or disc:

- The animal remains must be bagged separate from any debris, taken to the depot and the owner notified as soon as possible to be given the option of collecting their pet.

Where no collar/disc is found:

- The remains must be bagged separately from any debris found and returned to the depot where the entire body must be scanned for microchips and the ears checked for tattoos. Any positive identification must be marked on the form.
- Following positive identification the appropriate body must be notified; PetLog for microchips and the National Dog Tattoo Register for ear tattoos. The police or local authority dog warden must also be notified.

Remains that cannot be positively identified:

- The remains must be cold-stored where these facilities are available, for seven days or until the cold store is due to be emptied, whichever is sooner. The police or local authority dog warden must be notified of the details on the Identification of Canine Fatality form. If no owner has come forward at the end of the seven-day period the remains must be disposed of.

It must be noted that microchip scanners need to be used very close to the pet's body to register the presence of the chip although it should read the chip through a polythene bag.

The identification process should go as far as is reasonable however it is recognised that due to the high speed nature of our network it is impossible to guarantee that remains can be fully identified e.g. the microchip may have been lost in the collision. In this case, if the remains can be identified as canine, they should be cold stored and as much information as can be collected should be passed to the local police or dog warden.

Contact details for PetLog and the National Dog Tattoo Register can be found on the Identification of Canine Fatalities form included at Annex 7.17.1. It should be noted that PetLog is run by The Kennel Club and Service Providers will need to register with the site to use it.

7.18 Rapid Re-opening of Running Lanes Following Diesel and other Hydrocarbon Spillages**7.18.1 Introduction**

This chapter is written to ensure the rapid re-opening of running lanes following a diesel spillage. It is not intended to prescribe treatment methods although does prescribe the use of a risk assessment methodology to ensure consistency of response.

7.18.2 Background

Dealing with diesel incidents on the network and determining the treatment required based on the information available is a matter of routine for Service Providers. Although this chapter does not change this it does however require recognition of some of the decisions made consciously or subconsciously on the risks inherent in the treatment of diesel affected pavement. The treatment implemented and the resulting outcome can differ between Service Providers, leading to a variation in service.

The Highways Agency is therefore looking to ensure that all Service Providers aim their treatment to the same objective, with priority for pavement treatments given to opening running lanes as quickly as possible. Consequently, the Highways Agency has provided a methodology within this chapter to assist its Service Providers to meet this objective. However, in considering improved or innovative solutions Service Providers should remember that the re-opening of running lanes is the priority and this may mean deferring some work to a later time.

This methodology does not absolve the Service Providers of obligations to attend incidents and resolve them in accordance with current Legislation and Contractual requirements including Quality Promises and working practices on Environmental, Health and Safety, Hazardous Materials and Safe Working operations.

7.18.3 Risk Assessment of Diesel Affected Pavements

The Service Provider must determine the likely probability and impact of the risks in treating a diesel affected pavement using the risk matrix table at 7.1.8.1. Although there are a large number of risks to be considered in treating a diesel affected pavement those considered most relevant to rapid re-opening of running lanes are given within the table as A to E.

In considering where a Risk sits, it should be noted that 'Probability' is the likelihood of the risk having occurred or occurring imminently and Impact is the resultant delay in the time it will take to re-open the lane. The first usage of Table 7.18.1 will be when the Service Provider has initial access to the scene of the diesel spillage. A worked example is included in Annex 7.18.1.

Risks may vary during the course of the incident and will therefore need to be constantly reconsidered.

Any Service Provider proposed methodology for treating diesel affected pavements to allow the rapid re-opening of running lanes must have a dynamic risk assessment element. This will require a re-evaluation of the risks in the light of analysis of emerging information at a number of stages during an incident.

Risk

- A. Spillage of diesel as a result of recovery
- B. Excessive treatment of the pavement for the level of damage
- C. Skid potential
- D. Rutting
- E. Binder loss leading to break up of pavement material

Table 7.18.1 Risk Matrix Table

	Impact	Low (1)	Medium (2)	High (3)
Probability				
Low (1)				
Medium (2)				
High (3)				

An overall risk figure shall then be calculated by the summation of multiplying the value of the risk impact by the probability for each of the individual 5 risks.

If the overall risk figure:

- I. Is below 13, then there should be no obstacle to rapid re-opening of the lanes affected (see sections 7.18.4.1 and 7.18.4.2)
- II. Is between 13 and 20 inclusive, then consider the items raised in sections 7.18.4.1 and 7.18.4.2
- III. Is above 20, then see sections 7.18.4.1 to 7.18.4.3

If an individual risk scores over 4 the treatment should be re-considered and addressed when practical before the final treatment is determined. Please see Section 7.18.5 for other factors to consider. The Service Provider is required to revisit the table as information becomes available, which can be after a change in the nature of the incident or following a change in the data available to consider the incident.

7.18.4 Pavement Treatment

7.18.4.1 Rapid Re-opening

Rapid re-opening can be achieved by the use of modern absorbents followed by the application of grit sand. This is considered the quickest and most effective and efficient method of dealing with diesel spillages in the vast majority of cases.

Modern absorbents can treat a greater volume of spillage than traditional absorbents. Although they can be more expensive to purchase they are generally more cost effective as less absorbent is required to treat a spill, less waste is generated, and less room is required on vehicles to transport the material.

Grit sand is usually readily available, does not require specialist equipment to apply, and is relatively cheap. Grit sand also allows skid resistance to be addressed.

Treating the pavement by washing with detergents and cleaning the carriageway is unlikely to provide the quickest re-opening of running lanes. Care should also be taken to avoid pollution when detergents are used.

A list of potential treatment options is given in Annex 7.18.2. The list is not exhaustive.

7.18.4.2 Risk Considerations

Where a number of the risks have been classed as medium or high impact or probability this will give rise to a degree of uncertainty over the most appropriate course of action to take, i.e. whether to treat minimally and re-open the lane or to undertake more extensive treatment increasing the duration of the restriction and creating potential further delays and journey time unreliability for road users.

It is useful to consider some of the factors that contribute to the specific risks A-E.

A: The fuel storage locations, be they the vehicle fuel tank or any containers being transported, may not be leaking or ruptured as a consequence of an initial incident. However, if there is potential to need to apply lifting ropes and forcibly drag, lift or rotate a vehicle, then the storage containers may rupture. If the containers rupture, the duration of the incident may be extended, the impact of the diesel spillage may be increased and any affected running lanes may remain unexpectedly closed.

There are a number of methods to reduce this potential risk; siphoning, introduction of saw dust or introduction of a foaming agent to the fuel. If there is already a hole, but no leaking diesel, use of proprietary putty to plug the hole may be an option. Each option has its own advantages and disadvantages. Siphoning may well take the greatest amount of time to implement. Introduction of saw dust or a foaming agent to the fuel will give a rapid spillage prevention treatment, but will incapacitate a vehicle if it is applied to a drivable vehicle's fuel tank. The vehicle owner's agreement is essential, and should be sought by the Service Provider / Traffic Officer, if a foreign agent is to be added to a fuel container. If the vehicle owner is made aware of the risks and costs associated with spilt diesel this may help them agree to this course of action.

B: Diesel spilt on the carriageway leads to temporary softening and loss of surface texture. However, this damage is likely to be transitory on pavements in good condition if the excessive diesel is removed without delay. Consequently, unless there is clear evidence that the pavement is likely to fail catastrophically or imminently, then the extent of the damage at the

time of consideration will determine the treatment. Treatment by removal and resurfacing of damaged areas is unlikely to be cost effective and is generally not considered commensurate with the risk.

- C: Loss of friction leading to skidding is a concern in treating diesel spillages. Diesel on the pavement reduces the friction between tyres and the pavement, which can be exacerbated in wet conditions.

The risk of skidding from diesel remaining on the pavement when the lane is re-opened to traffic can be minimised. Application of an absorbent should remove surface standing diesel and any free diesel within the matrix of the pavement to a few millimetres in depth. The surface can then be treated with grit sand to prevent any diesel pumped to the surface from reducing the friction level provided.

- D: Highways Agency guidance on ruts does not require their immediate removal. If it is believed that ruts will form, then the immediate risk is potentially less than when the ruts do form, if they pose a hazard even when formed. When rutting has occurred, the Service Provider should give consideration to determine if they warrant treatment and to what extent.
- E: Where the degree of penetration of the diesel has broken down the majority of the binder, the pavement material may be susceptible to lifting by vehicle tyres. Under these conditions absorbents and grit sand may be inappropriate and a more intensive treatment may be required.

The Service Provider should consider if journey time reliability, or vehicle flow, can benefit from introduction of a reduced speed limit. Advisory speed limits may be set quickly where the technology is already in place; variable message signs can be used and matrix signs can be activated.

7.18.4.3 Further Considerations

If absorbents and grit sanding are not deemed adequate following assessment and amelioration, taking points in Sections 7.18.4.1 and 7.18.4.2 in to consideration, then an alternative treatment may be required.

The appropriate treatment may be determined by the factor contributing most to the risk assessment and potential for removal of the carriageway restriction.

- A: Potential spillage from a diesel storage location can be eliminated as a risk, therefore this should not be a reason for an alternative treatment. If vehicle owners are consulted properly by Traffic Officers and / or Service Providers they are unlikely to resist the use of actions to reduce damage and reduce claims.
- B: The approach of addressing each risk and continually re-evaluating its impact should enable lower levels of treatment to be considered.
- C: With the current use of absorbents and grit sand, adequate skid resistance can be achieved. There are likely to be few occasions for the need for alternative treatment due to a lack of skid resistance.
- D: Rutting may necessitate an alternative approach, but this should be considered in line with Highways Agency guidance on rutting.
- E: Where the degree of penetration of the diesel has broken down the majority of the binder, the pavement material may be susceptible to lifting by vehicle tyres. Under these conditions

absorbents and grit sand may be inappropriate and a more intensive treatment, often planning and paving, may be required.

7.18.5 Other Factors

There are a number of factors that cannot be addressed during the course of an incident. These factors include the alignment of the carriageway, pavement material and the weather. These factors may prevent the usage of the preferred treatment and in such instances it may be necessary to keep lanes closed

If specialist equipment is being considered, treatment shall result in a rapid re-opening of running lanes and represent value for money.

7.18.6 Traffic Officer Service

On the motorway network, and a few all purpose trunk roads, the Traffic Officer Service (TOS) may be involved. The TOS is trained in managing a spillage, though not in determination of the treatment. The Traffic Officer will assess the extent of the spillage, report details to the Regional Control Centre and request Service Provider attendance. They will ensure adequate signs are utilised as necessary and assist with containing the spillage and ensuring any required restrictions are in place. They should not direct a course of treatment.

If a Service Provider has any concerns over the activity of Traffic Officers at the scene of a diesel spillage they should be reported immediately to the Traffic Officer Service and then to the relevant Service Manager.

7.18.7 Environmental Considerations

Statutory Regulations requires that all diesel spillages be contained as fully as possible. Where necessary the Environment Agency must be contacted by the Service Provider and/or Highways Agency Traffic Officer Service as required under established contingency plans, or as directed by other attendees at an incident.

All waste must be contained, removed from site and be disposed of in accordance with Statutory Regulations and Service Providers Quality procedures.

7.18.8 Health and Safety Considerations

The implementation of the methodology required within this chapter must be considered by all Service Providers in terms of the health and safety of their workforce, other attendees at an incident, motorists and any other party that may be affected.

7.18.9 Liability

In treating a diesel spillage the Service Provider has to ensure they meet the requirements of their Contract, any relevant Quality Promises and any legislation applicable to their activities.

7.19 Use of non-standard CCTV

7.19.1 Introduction

This section addresses the use of non-standard Closed Circuit Television (CCTV), including the use of wireless technology, on the Network. It advises of the conditions regarding its use.

7.19.2 Background

Regional Highways Agency teams are committed to delivering increased visibility of the road network to the Traffic Officer Service (TOS), the Service Managers and Service Providers. One of the ways in which this is being done is through the deployment of non-standard CCTV⁶, particularly utilising wireless technology, for network monitoring purposes.

Over the last few years these installations have included:

- Fixed wireless cameras on the All Purpose Trunk Road (APTR) and motorways to monitor stretches of the network that do not have fibre optic cabling installed;
- Trailer mounted and other temporary cameras to monitor congestion around planned events, such as roadworks, and traffic conditions at major incidents; and
- Vehicle mounted cameras on Incident Support Units (ISUs) to aid in the handling of incidents on the network.

It is recognised that non standard CCTV offers value in supporting the Network Operator role as a low cost, short term alternative to the standard provided that certain conditions are met. Such conditions will ensure that such CCTV is used in a more co-ordinated, consistent and secure way.

7.19.3 Issues

Although the use of non-standard CCTV adds value it also brings with it a number of issues, including:

- Security concerns since the Highways Agency does not own the networks that these images are passed over or, in cases, the servers which they are stored on, though the images are our data asset;
- Difficulties viewing the images – these cameras are not integrated into our national network and thus have to be viewed on separate monitors either over the internet or through point to point connections. This means that operators in RCCs or the NTCC cannot easily access these images through the standard control office based systems and have to use separate monitors to view them. Although these cameras do not have the RCC as their destination, being able to view them would still be of value to the RCCs, NTCC, and other parts of the Highways Agency.
- Inconsistent maintenance of the equipment – non-standard CCTV it is not covered by the maintenance processes in place for our national systems. This means that users may not experience a common level of service across all the cameras that they use and that bespoke maintenance may not achieve best value.
- Bespoke installation standards – equipment deployed on the Network must be installed in accordance with Highways Agency standards so that it provides a safe and sustainable solution.
- Local investment decisions – investment into new installations of CCTV needs to be based on a sound business case which delivers them where they are most needed and can be of the greatest benefit to the Highways Agency as a whole. Currently, decisions are often

⁶ Note that this section does not cover Automatic Number Plate Recognition (ANPR), enforcement cameras or CCTV mounted on TOS vehicles.

made at a local level in response to immediate needs, as opposed to as part of an overall future-proofed, national or regional plan for the deployment of cameras.

7.19.4 The Way Forward

Traffic Technology Division (TTD) is leading in addressing this and following consultation with appropriate representatives from other areas of the Highways Agency, have established a three phase plan:

- Phase One – Continue with the installation of non-standard CCTV, in recognition of the benefits offered, provided that the issues listed in Section 7.19.3 are mitigated. Guidance on how this can be achieved and the approvals necessary is given in Section 7.19.6.
- Phase Two – Implementation of quick-win options allowing greater integration and access to images from non-standard CCTV.
- Phase Three – The development of a robust and future-proofed means of integrating these installations and their images to our national network.

7.19.5 Requirements

Before any further non-standard CCTV is deployed on the Network a number of risks need to be managed and approvals gained which are listed in the sub-paragraphs below.

7.19.5.1 Security

It is essential that the security of servers and the inability of people, other than those designated by the Highways Agency, to access the images on them be assured before non-standard CCTV cameras are installed. To fulfil this, the Service Provider must confirm that the recording of images complies with the Highways Agency's *Closed Circuit Television (CCTV) Recording Policy in Regional Control Centres (RCCs)*. This may be obtained from the Service Manager (or from the HA Portal [here](#)).

To help prevent thefts of equipment from mobile CCTV sites the Service Provider must ensure that all sites be physically secured prior to or as part of the installation of cameras.

To guard against the threat of access to the Highways Agency's computer networks through the non-Highways Agency networks that these cameras utilise, the Service Provider must ensure that the obligations and approvals of [Traffic Technology Division \(TTD\) Code of Connection MCH1514](#) are in place prior to connecting any non-standard CCTV to the Highways Agency's computer networks, NRTS or any CCTV/HATMS technology. The TTD Code of Connection should be completed through collaborative working involving the Regional Technology Team Leader, the Project Sponsor, any supplier organisations and the Technology Joint Security Working Group.

It should also be noted that even CCTV not connecting to any of the above Highways Agency owned networks is subject to the TTD Code of Connection, as all information produced (including CCTV images) for the purposes of the Highways Agency conducting its day-to-day business has to be appropriately managed and secured. This is in line with the [TTD Information Security Policy MCH2459](#).

7.19.5.2 Viewing the Images

Installing non-standard CCTV cameras without a feed to RCCs or NTCC may be permitted. For such circumstance the Service Provider must obtain the approval of the Regional Technology Team Leader who will ensure they factored into the regional plan for the deployment of cameras

(see also section 7.19.5.5). As part of this process the RCC and the NTCC should be consulted on whether they would like access to the camera as well.

If cameras are to be viewed within an RCC or the NTCC then the Service Manager will seek approval for their use from the Network Operations Manager (RCCs) or Operations Manager (NTCC). The Service Provider should assist in developing a document which outlines the impact on operational working practices of having images which cannot be viewed on the main screens, the impact on space of the additional terminals required to view the images, the acknowledgement of the lower picture quality that these cameras provide, and that appropriate IT support and maintenance arrangements have been made for any RCC / NTCC based equipment. The Service Manager will seek a decision based on this document prior to the investment in the camera being finalised.

7.19.5.3 Equipment Maintenance

The Service Provider must follow MCH1349, which can be obtained through the [Plans Registry website](#), and obtain the associated approval from the Regional Technology Manager to ensure that proper maintenance arrangements for the cameras and associated equipment and infrastructure will be in place. This will help ensure that issues such as spares, documentation, 3rd line support etc. are taken into account and that the parties responsible for the maintenance are identified and under the appropriate contractual cover.

The only departure from this is in the case where it can be demonstrated that the maintenance risk/liability remains with the supplier, e.g. where the maintenance and support issues are wholly provided by a service charge.

7.19.5.4 Installation Standards

The Service Provider is reminded that all installations are to have structural approval and to follow the fixing standards and approvals defined in [MCHW Volume 1 - Specification for Highways Work - Series 1300](#) and [BD 94/07](#).

7.19.5.5 Investment Decisions

Financial approvals for non-standard CCTV are subject to the appropriate ICF approvals processes. If the Service Provider writes business cases they should explain, before submitting business cases for approval, how the following issues are addressed:

- Lower picture quality – typically these cameras cannot provide the same picture quality that standard ones can and this should be considered when looking at the uses they are intended for.
- Future planning – non standard installations should be considered in the light of a regional plan for the deployment of cameras which recognises which locations offer the greatest benefit to the Highways Agency as a whole.
- Whole life cost – this area covers a number of considerations including: the life expectancy of these cameras is lower than that of standard cameras, maintenance costs may inflate the initial price, the cost of transmission of images from a 3rd party network (which is typically based on usage charges), and the possible cost of removal should they be replaced by standard cameras at some stage in the future.

The Service Provider must ensure that the Technology Gatekeeper (through the Technology Programme Performance Team) has signed-off the ICF Stage 1 before proceeding to installation.

7.19.6 Overall co-ordination of non-standard CCTV

CCTV Service Team in TTD will maintain a list of non-standard installations providing an overall national picture of where such cameras are deployed the Highways Agency's network. Once the appropriate approvals detailed above have been given, the Service Provider should inform the CCTV Service Team on CCTVServicesTeam@highways.gsi.gov.uk, and receive acknowledgement of the receipt of that information, of such installations.

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6.1 Network Occupancy Management

6.1.1 Introduction

This chapter sets out the procedures and arrangements for the management of road space occupancy required for works activities on the Highways Agency's motorway and all purpose trunk road network.

This information was originally released as a stand alone Process Document prior to its inclusion in this manual. Although minor amendments have been made to the language to ensure consistency here, the intention has not been to change the process. This chapter forms part of the Agency's standard for operation of its network and aligns with the May 2007 version of Asset Process number 4 (AP4).

These new arrangements become effective from 1st April 2007.

6.1.1.1 Background

The Highways Agency has a legal obligation under Section 59 of the New Roads and Street Works Act 1991 (NRSWA) to use its best endeavours to coordinate the execution of works of all kinds.

The Highways Agency has also been given a clear remit by Ministers to better manage its network with the objective of tackling congestion and improving journey time reliability.

6.1.1.2 Purpose

The purpose of this chapter is to set out roles, responsibilities, including mandatory requirements for Service Providers, and procedures for the management of network occupancy.

6.1.1.3 Network Occupancy Management Plan

A 'Network Occupancy Management Plan', setting out the approach to managing the Network, will be required to be produced and maintained for each Network. It will be used to demonstrate that the procedures detailed in this new process are used to ensure the effective management of road space. The plan will remain under continual review to ensure that the changing needs are embraced with effective network management. The key elements of the plan are detailed in Annex 6.1.1 and highlighted in this chapter.

Service Providers must assist their Service Manager with the preparation of a Network Occupancy Management Plan for submission to the Regional Network Access Manager.

6.1.2 Objectives

6.1.2.1 Process Objectives

The process introduces an improved set of procedures for the management of road space occupancy with the primary objective of reducing road user delay and the associated delay cost, through a structured evidence based decision making approach.

Rigorous application of the new process will ensure the potential reduction in average vehicle delay (AVD) is maximised. Improved network occupancy management will contribute to meeting the Agency's current public service agreement (PSA) Journey Time Reliability Target (further guidance included in Annex 6.1.4) and any other future congestion related performance targets.

6.1.2.2 Audience

The management of network occupancy is a wide ranging task involving many parts of the Highways Agency's organisation and many other external stakeholders. This chapter should therefore have a similarly wide ranging audience. The process described in this document is owned by Traffic Operations Directorate and is delivered primarily by the Service Managers and their Service Providers.

6.1.3 Scope

6.1.3.1 Process Scope

This section sets out the scope of the new process and defines the activities covered, and those activities not covered by the new network occupancy management arrangements.

The new arrangements do not fundamentally change any existing responsibilities (see below) but simply provide greater clarity on roles, responsibilities and objectives.

6.1.3.2 Primary Responsibilities

The primary responsibility for coordinating works activity on the network rests with the Service Manager and his team. Under existing MAC, MA/TMC and DBFO arrangements this responsibility is delegated contractually to the Service Providers.

There are a number of contract provisions that support the coordination function including the 'watchman role' and more specifically, the delegation of duties and powers under NRSWA.

Other organisations promoting and undertaking works on the Network should act in a cooperative manner with the Service Manager and his Service Provider. This is often a direct contractual requirement for other works promoters in the Highways Agency and is a legal obligation for statutory undertakers.

6.1.3.3 Activities Covered

Any activity on the Network that may contribute, either directly or indirectly, to congestion on the Network is covered by this process. This includes activities on the hard shoulder, cycle tracks and footways.

Activities covered by this process are categorised as follows:

- A. Major Schemes
- B. Area Schemes
- C. Area Renewals
- D. Routine Works
- E. Urgent Routine Works
- F. Regional Technology Schemes
- G. Regional Technology Works
- H. Urgent Regional Technology Works
- I. Street Works
- J. Urgent Street Works
- K. Developer Works
- L. Licensee Works
- M. National Technology Works

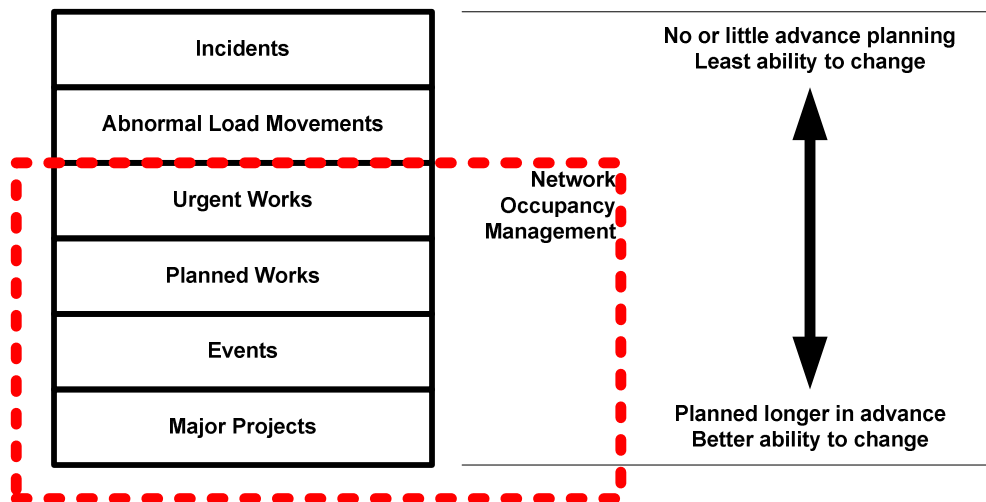
- N. Urgent National Technology Works
- X. Events

Although considered as 'off network', 'events' are considered an 'activity' in respect of this process.

Definitions of these activity categories are detailed in Part 0 – Introduction of the NMM.

6.1.3.4 Context & Hierarchy

The management of network occupancy is all about coordinating activities on the Network. This requires that consideration is given to all planned activities so that adjustments can be made to the occupancy configurations of individual activities such that the Network operates in the most efficient manner possible.



The above diagram shows a hierarchy of activities. In general, the longer in advance the activity is planned the better the ability to change occupancy configurations as part of the coordination process. The obvious exception to this is events, which are generally fixed with limited scope for influencing change.

As discussed below, there are certain activities that fall outside of the scope of this process.

6.1.3.5 'Out of Scope' Activities

There are a number of specific activities that are explicitly outside of the scope of this process, these are:

- 1) Abnormal Load Movements

The recording and coordination of abnormal load movements is not covered by the Network Occupancy Management process. Better information arising from the improved process will however provide a basis on which abnormal load hauliers can make better choices about routes and timing of movements. Further information concerning abnormal load movements is included in this document at 6.5.

- 2) Traffic Incidents

It is already a requirement for details of traffic incidents to be recorded on the Scheduled Road Works (SRW) system by Service Providers, see this document at 6.2, however, they

are not considered within the Network Occupancy Management process. The management of traffic incidents and the interrelation and interaction with pre-existing works on the network is considered in the Highways Agency's 'Asset Processes', numbers 1, 2 and 3.

3) Activities that do not have an impact on congestion

These are any activities where traffic management is not required. For example, short duration stops on the hard shoulder or mobile inspections not requiring a mobile lane closure.

Although the activities detailed above fall outside of the scope of the process, there are other obligations to manage those activities including specific requirements to populate relevant information on the SRW system. Further explanation of this is included in this document at 6.2.

6.1.3.6 Relationship to Other Processes & Policies

The arrangements for management of network occupancy, as detailed in this chapter, do not remove the need to follow other processes or policies. The new process provides an overarching framework for the management of planned activities on the Network.

There are existing arrangements in place for the evaluation and mitigation of delay impacts from specific schemes, particularly larger schemes, and these arrangements should continue to be applied. Examples include scheme specific cost benefit analysis and value management processes. A number of new initiatives relating to the management of road work activities at a scheme level are currently being developed and rolled out as part of the Highways Agency's delivery programme associated with the current PSA Target.

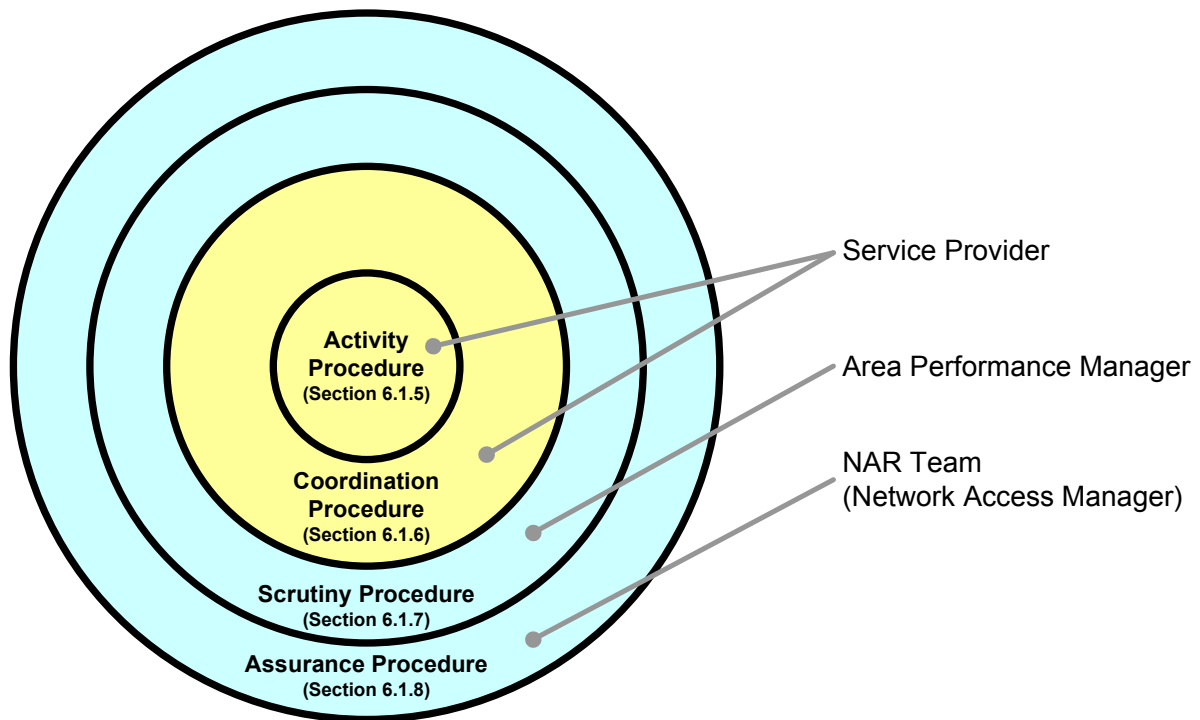
Existing arrangements for management of abnormal load movements and traffic incidents should be followed- see 6.5. The Network Occupancy Management process is complementary to these existing arrangements.

The Network Occupancy Management process extends the requirements of Chapter 6.2 of this document, policy originally published under cover of AMM58/05, but does not supersede them.

6.1.4 Process Overview

6.1.4.1 Introduction

This section provides an overview of the activity based and periodic procedures that comprise the network occupancy management process.



The colour coding used above is used in the remainder of the chapter. Light yellow denotes a function that is primarily the Service Providers responsibility and light blue denotes a function that is primarily the Highways Agency's responsibility.

6.1.4.2 Activity Procedure (Section 6.1.5)

This procedure details the requirements and responsibilities for ALL 'activities' which take place on the Network and that are within the scope of the Network Occupancy Management process. This is primarily the management of activity booking and evaluation of activities on the network.

The Service Provider is responsible for discharging this procedure for any activity taking place on the Network.

6.1.4.3 Coordination Procedure (Section 6.1.6)

This procedure details the requirements and responsibilities to enable 'coordination' to be carried out in accordance with the Network Occupancy Management process. This is primarily the management of road space occupancy to minimise road user delay through a structured procedure of coordinating multiple activities.

The Service Provider is responsible for discharging this procedure for any activity taking place on the Network.

6.1.4.4 Scrutiny Procedure (Section 6.1.7)

This procedure details the requirements and responsibilities to enable 'scrutiny' to be carried out in accordance with the Network Occupancy Management process. This is first, an assessment of the Service Provider's approach to the forward planning of works activities on the Network. Second, it is a retrospective interrogation of the Service Providers' performance in respect of the coordination of works. Third, it is a review of the Service Providers contract compliance in delivering their duty with regard to network management occupancy.

The Service Manager is responsible for discharging this procedure.

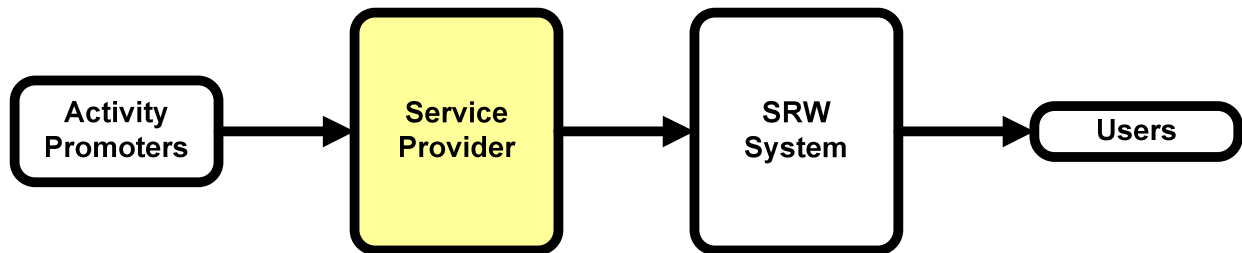
6.1.4.5 Assurance Procedure (Section 6.1.8)

This procedure details the requirements and responsibilities to enable 'assurance' to be carried out in accordance with the Network Occupancy Management process. There are two specific functions, compliance auditing and regional and national coordination, to ensure that network occupancy management is being carried out effectively and in accordance with the process.

The Highways Agency's Network Access and Resilience Team deliver this procedure for which the Highways Agency's Network Performance Manager is responsible.

6.1.4.6 Information Flows

Proper management of network occupancy requires complete knowledge of all planned activities. The Highways Agency's SRW system is the single central repository for information on all planned activities. Further information on SRW can be found in Chapter 6.2.



Although the primary use for the SRW system is by the Service Provider in delivering his obligations under this process, there are many users of the information contained with system.

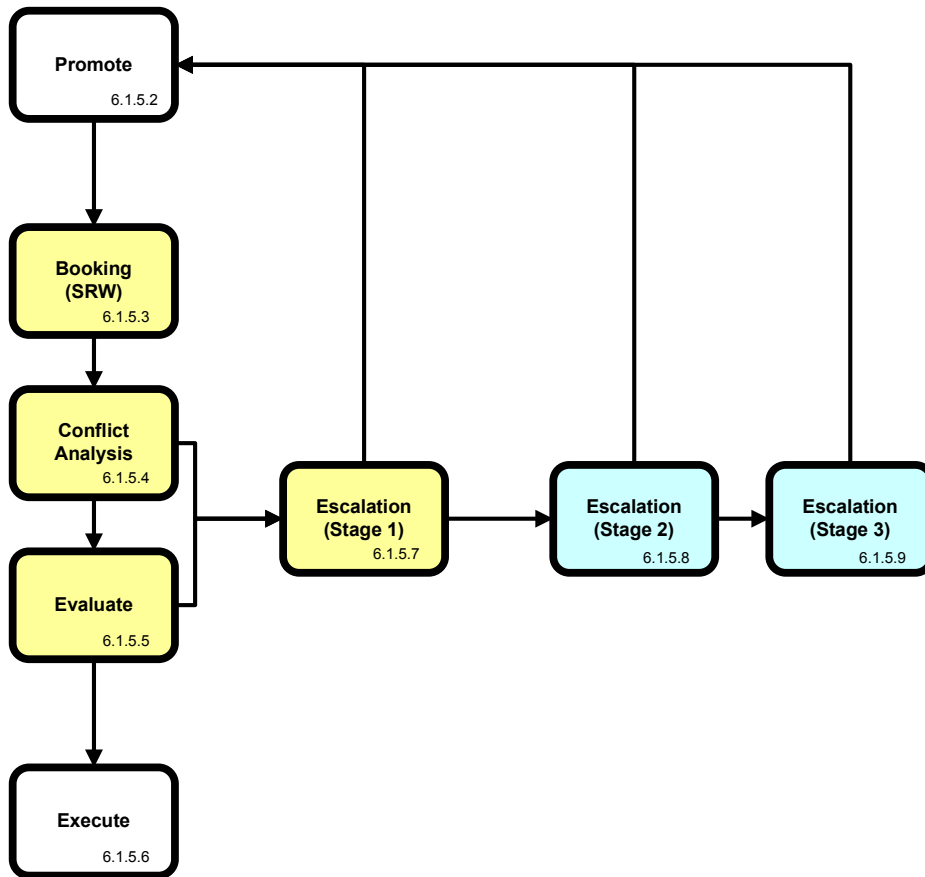
The above diagram summarises the information flows to and from SRW and emphasises the importance of the service providers' role in populating the SRW system.

6.1.5 Activity Procedure

6.1.5.1 Introduction & Overview

This section sets out the activity level procedure which must be applied to all activities covered by the Network Occupancy Management process.

The following diagram depicts the elements of the Activity Procedure.



6.1.5.2 Promote

Every activity on the Network is as a result of an identified need. Activities are either promoted by the Highways Agency in order to improve or maintain the network infrastructure or they are promoted by third parties in order to place or maintain apparatus (statutory undertakers and private licence holders) or to accommodate a changed requirement for access the network (developers).

In this process, Activity Promotion is the act of informing the Service Provider of the activities that are planned. This information must be provided in the prescribed manner as detailed under 'Booking' below and in Annex 6.1.2- Activity Booking Information.

It should be noted that there may be a number of different promoters for activities within each category, for example, major schemes might be identified by the Highways Agency's Network Strategy or Major Projects Division. In order to ensure consistency and clarity of roles the table below defines responsibility for notification as well as identifying the promoter. The responsibility for notification will always rest with either the Service Provider or the Service Manager, with the exception of major schemes, where the Highways Agency's Network Performance Manager is responsible for ensuring the Service Provider is supplied with the correct information.

The following table details responsibility for notifying the Service Provider of these activities and providing accurate booking details:

Activity	Promoter	Responsibility for Notification
A - Major Schemes	Scheme Sponsor (NS or MP)	Network Performance Manager
B - Area Schemes	Service Manager	Service Manager
C - Area Renewals	Service Manager	Service Manager
D - Routine Works	Service Provider	Service Provider
E - Urgent Routine Works	Service Provider	Service Provider
F - Regional Technology Schemes	Contract Project Sponsor	Service Manager
G - Regional Technology Works	Contract Project Sponsor	Service Manager
H - Urgent Regional Technology Works	Contract Project Sponsor	Service Manager
I - Street Works	Statutory Undertaker	Service Provider
J - Urgent Street Works	Statutory Undertaker	Service Provider
K - Developer Works	External Party	Service Manager
L - Licensee Works	External Party	Service Provider
M - National Technology Works	Contract Project Sponsor	Service Manager
N - Urgent National Technology Works	Contract Project Sponsor	Service Manager
X - Events	External Party	Service Provider

The Service Provider must complete the Activity Promotion process for those activities above where they are identified as having responsibility for notification.

In many cases day to day responsibility for promoting work to the Service Provider will be delegated to a contractor. For example, with technology works the responsibility might be delegated to the TechMAC provider. It should also be noted that some area contracts include technology maintenance and therefore the promoter would be the Service Provider.

Delegation is also likely to occur with scheme works, private developer works and works undertaken under licence. In such cases the arrangements will be clearly set out in the individual contract, agreement or licence.

In respect of DBFO contracts responsibility for promotion and notification of Area Renewals rests with the Service Providers.

In the case of events, there is no legal duty to notify the Highways Agency of events and therefore the Service Provider must proactively source information from the organiser or from other sources for example, NRSWA Coordination meetings, Safety Advisory Group (SAG) meetings, licensing authorities and relevant police authorities.

As each area will have different arrangements in delivering this element of the process, the 'flow of information', detailing the arrangements outlined in the above table will be included within the specific area Network Occupancy Management Plan. The plan will be prepared by the Service Manager and the Service Provider and it will define the precise responsibilities for notification of the activities, including full details of delegations. These details will be made available to all parties mentioned within the plan.

6.1.5.3 Booking (SRW)

Every activity that falls within the scope of this process must be entered onto the SRW system, firstly as a provisional and then as a firm booking, including any subsequent changes. A provisional booking is made further in advance than a firm booking and may include less detail.

The Service Provider must complete the activity booking in all cases for any activity which is to take place on the Network. The information required to be entered onto the SRW system is defined in Annex 6.1.2 - Activity Booking Information and the information must be entered in accordance with the requirements detailed below.

Data Entry Requirements

The following table defines the minimum requirements for advance entry of data onto the SRW system by the Service Provider.

Activity	Provisional Booking	Firm Booking
A - Major Schemes	60 months	6 months
B - Area Schemes	12 months	3 months
C - Area Renewals	12 months	3 months
D - Routine Works	12 months	3 months
E - Urgent Routine Works	N/A	15 minutes / 3 days
F - Regional Technology Schemes	12 months	3 months
G - Regional Technology Works	12 months	3 months
H - Urgent Regional Technology Works	N/A	15 minutes / 3 days
I - Street Works	12 months	3 months
J - Urgent Street Works	N/A	15 minutes
K - Developer Works	12 months	3 months
L - Licensee Works	12 months	1 month
M - National Technology Works	12 months	3 months
N - Urgent National Technology Works	N/A	15 minutes / 3 days
X - Events	N/A	12 months

These requirements are dependent on knowledge of the activity being available and therefore endeavours must be made by the Service Provider to secure the necessary information from promoters. Nevertheless, there may be occasions where certain activities are not known about within the timescales above, although these will be relatively rare.

It is important to note that bookings can be amended at any time up to commencement of the activity. The firm booking does not mean that activity configurations cannot be subject to further refinement. This is likely to be the case as proactive coordination of activities is undertaken.

In respect of urgent works, the requirement for firm booking is 3 days in advance in cases where the permanent category 1 defect repair is undertaken subsequent to a temporary repair.

Street Works

The timing of notifications given by Undertakers in respect of Street Works is defined in regulations under the New Roads and Street Works Act 1991 (NRWSA). Those timings are an absolute minimum and Service Providers must encourage undertakers to work to the standards detailed in this document.

Activities by Licensees

Activities of third parties working under Highways Act 1980 licences should be closely managed by the Service Provider and the requirements for the submission of information, including timing, should be detailed within the individual licence agreements.

Activities by Developers

Activities of third parties working under planning regulations should be closely managed by the Service Provider and the requirements for the submission of information, including timing of the works, should be detailed within the individual planning conditions and contract agreements.

6.1.5.4 Conflict Analysis

As part of the activity booking procedure, the functionality of the SRW system identifies any direct conflict between competing demands for the same road space from different activities. This is a 'simplistic' comparison of data on the system and should be taken as such by the Service Provider.

The Service Provider must review the results and resolve with the activity promoter and if necessary utilise the Escalation procedure.

6.1.5.5 Evaluate

Activity Evaluation is the core element of the Activity Procedure. The primary objective is to use the delay and delay cost evaluation to make informed decisions in respect of occupancy configurations.

At this stage of the process an evaluation is made on an individual works activity. Examining how adjustments may be made to one specific works in order to reduce delay and delay cost.

Once activity details have been entered onto SRW, the system will provide an instant evaluation of delay and delay cost. The Service Provider must adjust occupancy configurations in order to produce an optimum configuration taking into account the evaluated delay and delay costs.

The evaluation stage should be used to test broad options for larger works. Where options have been identified that offer significant delay savings but where there are consequential increased works costs, the options must be presented to and discussed with the Service Manager. A decision on which option to take forward will then be made based on consideration of the best overall value.

For smaller works and routine operations, slight changes to occupancy configurations may result in delay savings without any significant consequential increase in works costs. For example, moving the window for overnight works to start from 8pm rather than 7pm may produce a significant delay saving without the need to change shift patterns.

By using the evaluation information, a Service Provider will be able to demonstrate they are working to an evidence based decision making approach and also demonstrate tangible benefits resulting from changes to occupancy configurations.

It is important to remember that the evaluation produces estimated delay figures based on a number of assumptions and certain network specific information. Clearly the figures produced should be treated as indicative rather than absolute. Nevertheless, the figures will provide a reasonably accurate guide if assessed on a relative basis by comparing delay evaluations produced for the same activity booking by entering different configurations.

The delay and delay cost evaluation provides information to help in the decision making process, however, it cannot provide a definitive assessment of potential AVD impacts under the PSA target. The system does indicate delay and delay cost that occurs during PSA measurement hours and therefore this information can be used to ensure delay is minimised at times where an adverse affect on AVD may result. Clearly Service Providers must always take steps to change occupancy configurations to ensure that potential AVD is kept to a minimum.

The Service Provider must undertake Activity Evaluation at the time of Activity Booking.

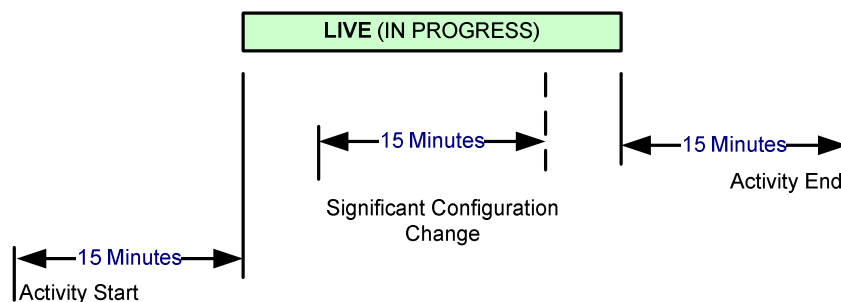
6.1.5.6 Execute

Activity Execution is the execution of the activity on the network.

It is the responsibility of the Activity Promoter (or nominated representative) executing the works to inform the Service Provider at three key stages of the activity:

1. the start of the activity,
2. at any significant change in occupancy configuration during the activity (which results in a change in capacity such as a change in the total number of lanes available), and,
3. at the end of the activity.

The following diagram depicts the requirements for entry of data onto the SRW system by the Service Provider (there are a number of specific exceptions detailed below).



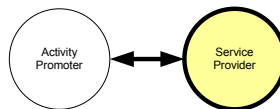
These requirements are for entry of data onto the SRW system and therefore the Service Provider must ensure that arrangements are put in place to ensure notification of information is undertaken in a timely fashion in order that the above requirements can be met.

In the case of urgent works (activity categories E, H J and N), there is no requirement for the notification of start of the activity, as this has effectively been provided at the time of notification and firm booking of the activity.

There is no requirement for the entry of activity start and activity end information for events (activity category X).

6.1.5.7 Escalation (Stage 1)

Escalation (Stage 1) is where a direct conflict is identified or where the evaluation indicates a significant consequential road user delay cost (and where mitigation may be possible). The Service Provider must escalate the issue to the Activity Promoter and request a change in the planned occupancy configuration to ensure road user delay is reduced. The Activity Promoter should then submit a revised configuration for the planned activity occupation to the Service Provider through the normal channels. The Service Provider must update the SRW system with these subsequent changes. Where escalation has not resulted in a change, and the matter is not subject to further escalation, details shall be entered on the system explaining the resolution of the problem.



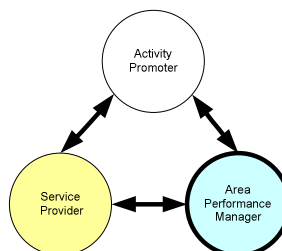
The Service Provider is responsible for Escalation (Stage 1).

Major Projects and Network Strategy Developer Projects are excluded from Escalation Stage 1 and should go directly to Escalation Stage 2 once identified.

6.1.5.8 Escalation (Stage 2)

Escalation (Stage 2) is where an issue is not resolved at Escalation (Stage 1). In such cases the Service Provider must initiate Escalation (Stage 2) by referring the issue to the Service Manager.

The Service Manager will discuss the issue with the Activity Promoter and seek agreement to the requested change. These discussions will usually involve the Service Provider and once the issue is resolved the Activity Promoter should then submit a revised configuration for the planned activity occupation to the Service Provider through the normal channels. The Service Provider must update the SRW system with these subsequent changes.



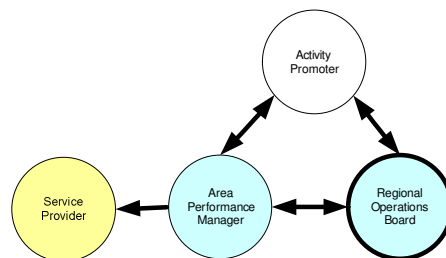
Where escalation has not resulted in a change, and the matter is not subject to further escalation, details shall be entered on the system explaining the resolution of the problem.

The Service Manager is responsible for Escalation (Stage 2). Escalation (Stage 2) includes escalation, using the established Tasking and Co-ordination arrangements, within the Traffic Operations hierarchy including Network Performance Manager and Divisional Director.

6.1.5.9 Escalation (Stage 3)

Escalation (Stage 3) is where an issue is identified that cannot be resolved within the Traffic Operations Directorate at Escalation (Stage 2). Escalation (Stage 3) involves cross directorate liaison and issues will be referred to the appropriate Regional Operations Board (ROB) or ultimately to the National Operations Group (NOG). In all cases the Service Manager is responsible for initiating Escalation (Stage 3) by referring the issue to the appropriate Regional Operations Board (ROB).

The appropriate ROB representatives will discuss with the Activity Promoter to seek agreement on the proposed change. These discussions would normally involve the Service Manager who may also require the involvement of his Service Provider. Once the issue is resolved the Activity Promoter should submit a revised configuration for the planned activity occupation to the Service Provider through the normal channels. The Service Provider must update the SRW system with these subsequent changes.



The Regional Operations Board is responsible for Escalation (Stage 3).

Escalation to Stage 3 should only occur in exceptional circumstances.

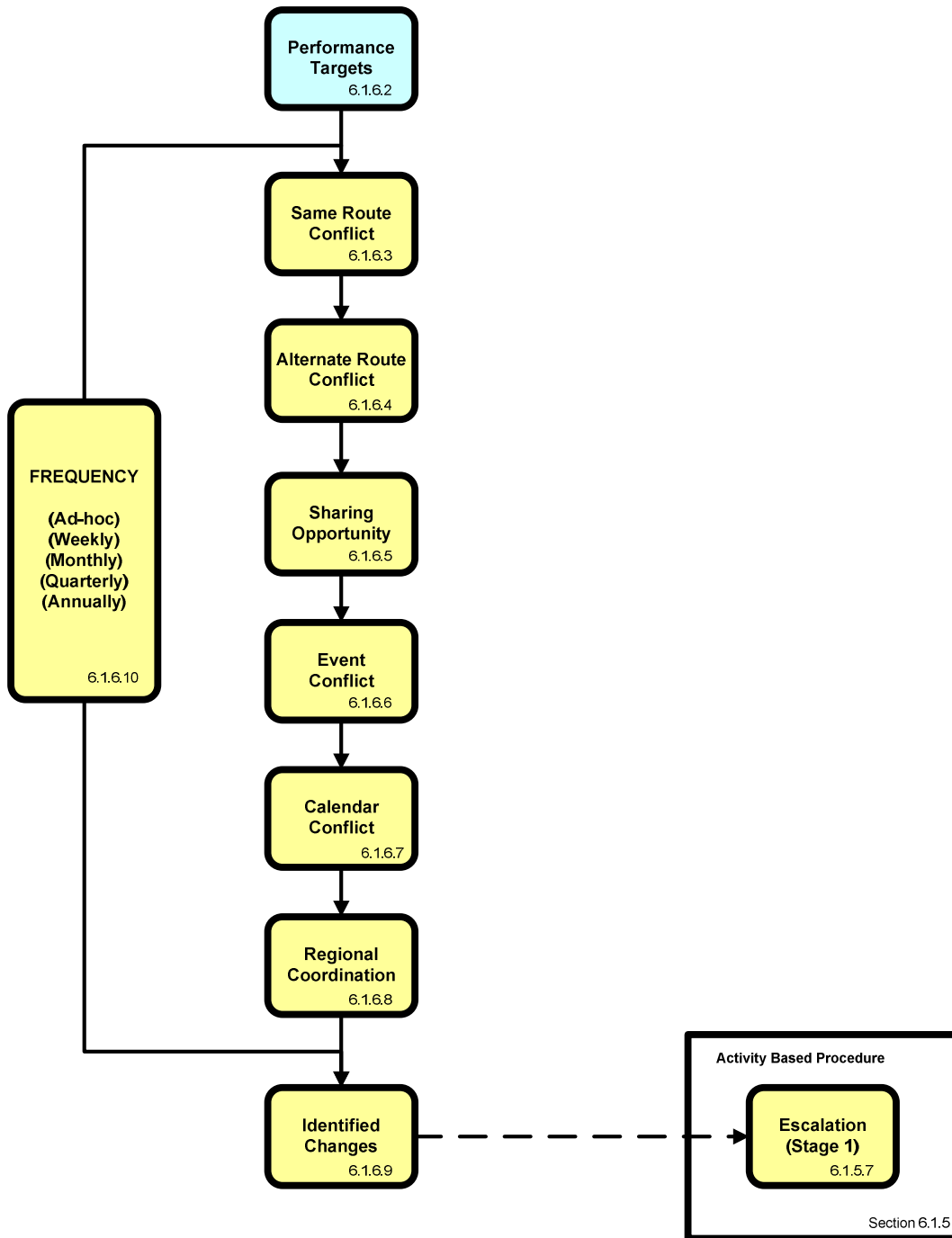
The Regional Operations Board only meets at a defined frequency. Escalation to Stage 3 is likely to relate to larger schemes which will generally have been notified well in advance and therefore it is likely that an issue can be addressed at one of the planned ROB meetings. If a more urgent resolution to an issue is required, the Traffic Operations representative on the ROB should initiate a direct dialogue with the representative from relevant directorates.

6.1.6 Coordination Procedure

6.1.6.1 Introduction

Coordination is the review and management of road space occupancy, to ensure the minimum road user delay results from a given amount of activity on the network. The Service Provider must undertake the Coordination Procedure.

The following diagram depicts the elements of the Coordination Procedure.



When undertaking the Coordination Procedure the Service Provider will need to consider the wider objectives, policies and obligations of the Agency. These will include:

- o **Environmental Considerations**

Moving the occupancy period of a works activity to a time of day where road user delay may be reduced may have the negative impact of creating excessive noise at unsocial hours. Steps should always be taken to reduce detrimental environmental effects of works activities. However, the greater benefit to society as a whole may outweigh the localised dis-benefit arising from works being carried out during unsocial hours.

- **Health & Safety Considerations**

All activities undertaken on the network present potential health and safety risks to road work workers and the public alike. These risks are always evaluated and reduced however the risks can never be totally removed. In assessing potential opportunities to reduce road user delay through coordination of works activities it is necessary to consider fully the implications on health and safety although it should not be assumed that an increased health and safety risk will always result in any proposed changes being rejected. In every case the balance between all issues should be taken into account.

- **Economic Considerations**

It will often be possible to improve the configuration of road space occupancy and reduce the impact on road users without increasing the works costs and this should always be the primary aim. There will be circumstances where, in order to reduce road user delay cost, it is necessary to reconfigure road space occupancy in such a way that there is a resultant increase in the direct cost of executing the works. In such circumstances the Service Manager will consider the costs and benefits.

- **Impacts on Other Stakeholders**

There may be occasions where actions taken to reduce the impact of works on road users on the Agency's own network may have a detrimental effect on road users on other highway authorities' networks. In such cases consideration should be given to the overall cost or benefit to society as a whole and appropriate action taken. Therefore it is essential to liaise with Local Highway Authority representatives at the earliest appropriate opportunity.

The role of coordination must be undertaken by the Service Provider with a wider remit than just the 'area' i.e. activity in adjacent areas. To fulfil this role the Service Provider must liaise with a range of personnel, specifically those of adjacent area service providers and local highway authorities. There are many groups providing platforms for the exchange of relevant advance coordination information, for example local NRSWA coordination meetings and Safety Advisory Groups.

6.1.6.2 Performance Targets

The Highways Agency must meet a variety of performance targets such as the Public Service Agreement (PSA) targets (further guidance on PSA Journey Time Reliability included in Annex 6.1.4). Performance targets will be set at an Agency wide level and will be cascaded down through the organisation so that the contribution required to meet the target at a regional, area or route level is clearly understood and visible to all.

Although Service Providers are contractually obliged to manage network occupancy these contractual obligations do not extend to meeting the Agency's overall performance targets. In undertaking their role of coordination, Service Providers must take into account the performance objectives of the Agency, along side all of the other considerations detailed above.

Making the Service Provider aware of the relevant performance targets is the responsibility of the Service Manager, who will review achievement against those targets. This awareness will include the examination of priority routes within a specific area or the management of specific works activities on a particular route or area.

In undertaking the coordination procedure consideration needs to be specifically given to the defined targets and the priorities of the routes on which activities are planned. In addition, the

relative significance of the activities should be considered and coordination effort focused on those activities with the potential to cause most disruption. The use of prioritised listings from the SRW system should be used to identify those activities requiring the greatest coordination input.

Any area or route performance targets, or priorities, will be set out in the Network Occupancy Management Plan.

6.1.6.3 Same Route Conflict

This is an assessment of whether multiple activities may conflict with each other on the same route. Currently, a set of guidelines exist, within the Road Users Charter 2002/3, regarding the proximity of works to each other which is based on a simple pre-defined distance. This should only be used as a simple guide when considering possible conflicts and should not be considered an absolute requirement. There may be occasions where there is merit in deliberately programming a number of activities to occur at different locations along the same route in order to concentrate the disruption in one clearly identified period. In such cases details of the route and time of the planned programme should be clearly publicised by the activity promoter.

The evaluation model within the SRW system does not calculate aggregated delay and delay cost for multiple works on the same route and therefore simply combining figures from the individual evaluations will give a significant overestimate. Care therefore needs to be taken when using the evaluation tool in these circumstances.

The Service Provider must undertake the identification of 'Same Route Conflicts'.

6.1.6.4 Alternate Route Conflict

This is an assessment of whether multiple activities may conflict with each other on potential alternative routes. This particularly addresses the need to ensure that major works are not carried out on routes where works are also being undertaken on their strategic diversion routes or other alternative routes. For example, in planning works on the M1 between London and Birmingham consideration would need to be given to any works planned to be undertaken at the same time on the M40. Service Providers should identify, for each route they manage, all of the other routes, both within and outside their area, where such consideration would be required.

In cooperation with local highway authorities, and using information available from them, any potential conflict with works on strategic or tactical diversion routes should be considered. Information on other authorities' works will not be included on the SRW system and therefore Service Providers will need to source information using the established lines of communications with other authorities.

The Service Provider must undertake the identification of 'Alternate Route Conflicts'. These will be detailed in the Network Occupancy Management Plan for the area.

6.1.6.5 Sharing Opportunity

This is an assessment of all planned activities at a specific location over a period of time to identify if there is any potential for changing the timings of activities so that traffic management arrangements can be shared.

This approach may appear to conflict with the existing proximity rules but these can be relaxed where an overall benefit can be demonstrated in terms of reduced road user delay.

The Service Provider must undertake the identification of a Sharing Opportunity.

6.1.6.6 Event Conflict

This is an assessment of potential conflict of works with planned off-network activities, such as county shows, football matches or pop concerts.

It should be noted that events are pre-planned activities that are generally 'fixed' in respect of timing and location and involve a number of diverse parties in their planning, for example the event organisers, the emergency services and local highway authorities. Therefore, the Service Provider must give consideration to other works activities on the network and the potential impact of the particular occupancy configurations planned to be deployed, as this may ultimately have an adverse impact on traffic.

In planning activities as part of the Network Occupancy Management process, consideration must be given to the potential changes to planned events such as a late kick off or the need to play extra time at a football match.

The Service Provider must identify and manage Event Conflict.

6.1.6.7 Calendar Conflict

This is an assessment of whether activities are being undertaken at a time where there is an increased risk of additional delay arising due to increases in traffic volumes as a result of seasonal variations and national and local holidays.

Consideration should be given to avoid undertaking works on public holidays where holiday traffic may significantly increase overall traffic volumes. The risk of adverse publicity arising from undertaking works at inappropriate times must always be assessed. Certain public holidays will see a reduction in overall traffic volumes: works should not be restricted simply because it is a public holiday although a balance will always need to be struck between the benefit gained from reducing overall delay and delay cost and the potential adverse publicity. In general, decisions should be made based on a demonstrable and defensible reduction in delay and delay cost.

Consideration must also be given to school holiday periods or 'works' holidays where traffic flow patterns may change significantly. The traffic data held in the SRW system, used to calculate the delay and delay cost, may not reflect the specific timing of holidays, particularly half-term holidays.

It is important that this issue is taken into consideration when planning network occupancy. The Service Provider must assess Calendar Conflict.

6.1.6.8 Regional Coordination

The Service Provider must carry out Regional Coordination which takes into consideration activities in adjacent areas and on the adjoining local road network.

This will include reviewing and assessing activities on the adjacent road networks and particularly considering any potential regional implications and impacts arising from specific individual activities, or from the interaction between different activities.

Effective Regional Coordination will require the Service Provider to work closely with neighbouring service providers and Local Highway Authority representatives. This may include the National Authorities for Scotland and Wales and their service providers. Liaison arrangements and contact details will be set out in the Network Occupancy Management Plan for the area.

Where a Service Provider considers an activity meets the definition of a 'Nationally Significant Activity' they must notify their Network Access Manager and provide all relevant information. The Network Access Manager will confirm whether the activity in question is to be treated as a 'Nationally Significant Activity', falling within the Network Access and Resilience Teams' oversight responsibility under their National Coordination role. In all cases, the Service Provider retains responsibility for coordination.

Further details of the National Coordination role, part of the Assurance Procedure, can be found at section 6.1.8.4.

6.1.6.9 Identified Changes

If the procedure is being applied robustly, changes to the occupation configuration of activities will arise. This will result in Escalation (Stage 1) at the Activity Procedure stage.

The Service Provider is responsible for identifying any potential changes required as a result of a coordination conflict. The Service Provider will act on any conflict in accordance with the procedures in this Network Occupancy Management process and must update the SRW system accordingly.

6.1.6.10 Frequency

The requirements for advance submission of information are driven by the need to facilitate the coordination procedure.

Coordination is undertaken on both a reactive basis in response to information received about specific activities and on a pro-active basis by periodically reviewing planned occupations. The frequency and level of detail of these periodic reviews will vary depending on particular circumstances. It is suggested that, as a minimum, two levels of formal review are undertaken; monthly and quarterly.

Service Providers must set out their proposed coordination arrangements detailing the frequency and scope of their planned reviews, taking into account the guidance given in this section.

Suggested Regime

The following table summaries the suggested regime undertaken by the Service Provider as part of their coordination responsibilities.

Frequency	Review Window	Typical Scope
Ad-hoc	As required	Undertaken as and when required, usually as a result of the entry of a significant new activity onto the system or after being made aware of an unplanned event or incident. Likely to be undertaken on specific routes or parts of the network.
Weekly	One month	Generally focused on the detailed coordination of routine maintenance activities and smaller scheme works. Usually only considering activities that are wholly within the area (or route).

Frequency	Review Window	Typical Scope
Monthly	Three months	Generally focused on the more significant area schemes and activities promoted by other contractors and third parties. This would be where the main coordination activity is undertaken and is likely to result the most incidences of escalation. The monthly coordination also takes a wider geographic view on activities in adjacent areas (Regional Coordination).
Quarterly	Twelve Months	Longer term planning of works programme paying particular consideration to major schemes and significant area schemes. The quarterly coordination will also focus on performance targets for the forthcoming year.
Annual	Three Years	Longer term planning of major schemes and schemes at feasibility stage. This annual coordination will generally be undertaken in conjunction with other stakeholders and is likely to follow a structured process.

Service Managers and their Service Providers should already have structured meetings in place to address the issues discussed above. Wherever possible, such existing meetings should be used as the basis for the new network occupancy management arrangements and these will be defined in the Network Occupancy Management Plan.

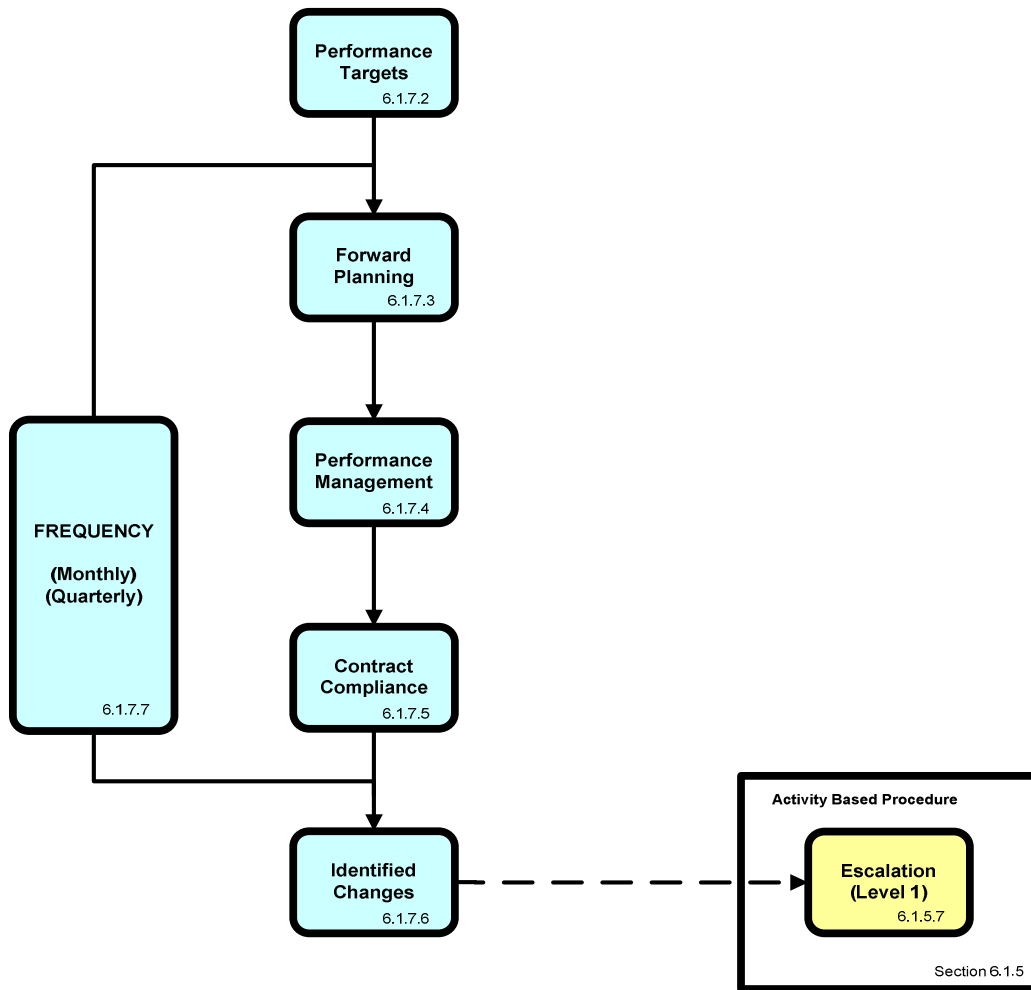
6.1.7 Scrutiny Procedure

6.1.7.1 Introduction

The Scrutiny Procedure is made up of three specific elements. First, Forward Planning which is an assessment of the Service Provider's approach to the forward programming and planning of works activities on the network. Second, Performance Management, which is a retrospective interrogation of the Service Providers performance in respect of the coordination of works activity on the network. Third, Contract Compliance, which is a review of the Service Providers compliance with the contractual obligations in respect of the management of network management occupancy.

Scrutiny is a procedure which is the responsibility of the Service Manager.

The following diagram depicts the elements of the Scrutiny Procedure.



6.1.7.2 Performance Targets

The Performance Targets are as described in Section 6.1.6.2 of this chapter.

6.1.7.3 Forward Planning

Forward Planning is the objective examination, review and approval of the Service Provider’s programme and shall be carried out at regular intervals in advance of the commencement of works activity. This programme shall consist of any activity on the network that may contribute, either directly or indirectly, to congestion on the network.

Activities covered by this examination are categorised in section 6.1.3.3.

Forward Planning is the responsibility of the Service Manager.

6.1.7.4 Performance Management

In future contracts, incentives will be used to secure better management of road space occupancy. In the short to medium term, use of a proactive performance management regime will help ensure performance targets are met. This approach will drive improved performance of both Service Providers and Service Manager.

The two primary performance indicators are detailed in the following table:

PI	Indicator	Target
P1	Average (Mean) monthly total delay over last 12 months	Set locally
P2	Standard Deviation of monthly total delay over last 12 months	Set locally

These primary indicators are focused on the performance of the network and can be reported at national, divisional, regional, area and route level.

These two primary indicators are supported by a set of secondary indicators which provide a broad range of management information, including information on the quality and timeliness of data. These secondary indicators should be considered in conjunction with the primary indicators to assess the overall performance of the Service Provider.

SI	Indicator	Target
S1	Compliance to NOM real-time logging requirements	100%
S2	Predicting accuracy	Set locally

Performance Management is the responsibility of the Service Manager, who will set targets and review their status and progress to meeting them.

The SRW system will provide reporting functions to support this performance reporting.

6.1.7.5 Contract Compliance

The Service Manager's contract management function specifically considers the Service Provider's compliance with their delegated responsibility to undertake the management of network occupancy. The Service Manager will be able to use a number of tools to ensure contract compliance, including auditing. Key Performance Indicators (KPIs) and Key Contract Indicators (KCIs) are already established in various forms within existing contracts and these will co-exist with the new indicators detailed above.

Contract Compliance is the responsibility of the Service Manager.

6.1.7.6 Identified Changes

The scrutiny procedure itself may result in the identification of a need to change occupancy configuration.

The Service Manager is responsible for identifying any potential changes required as a result of the scrutiny procedure. The Service Manager will inform the Service Provider who must initiate the Escalation (Stage 1) element of the Activity Procedure.

6.1.7.7 Frequency

The scrutiny procedure should be undertaken at a pre-defined frequency set down by the Service Manager. This regime should be established taking into account the guidance provided in this chapter.

Suggested Regime

Version	1	Amend.	8	Issue	Jul 09
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The following table summarises the suggested regime undertaken by the Service Manager as part of their scrutiny responsibilities.

Frequency	Typical Scope
Monthly	Examination of the Service Providers quarterly forward programme. Review of the Service Providers previous quarters performance in managing coordination.
Quarterly	Examination of the Service Providers annual forward programme. Review of the Service Providers previous annual performance in managing coordination. Review of the Service Providers contract compliance (including reporting).

It is essential that there is continuity across all the procedures described in this process document. This is best demonstrated by carrying out the Coordination reviews, required in Section 6.1.6, at the same time as the Scrutiny, detailed at Section 6.1.7. The arrangements are detailed in the Network Occupancy Management Plan.

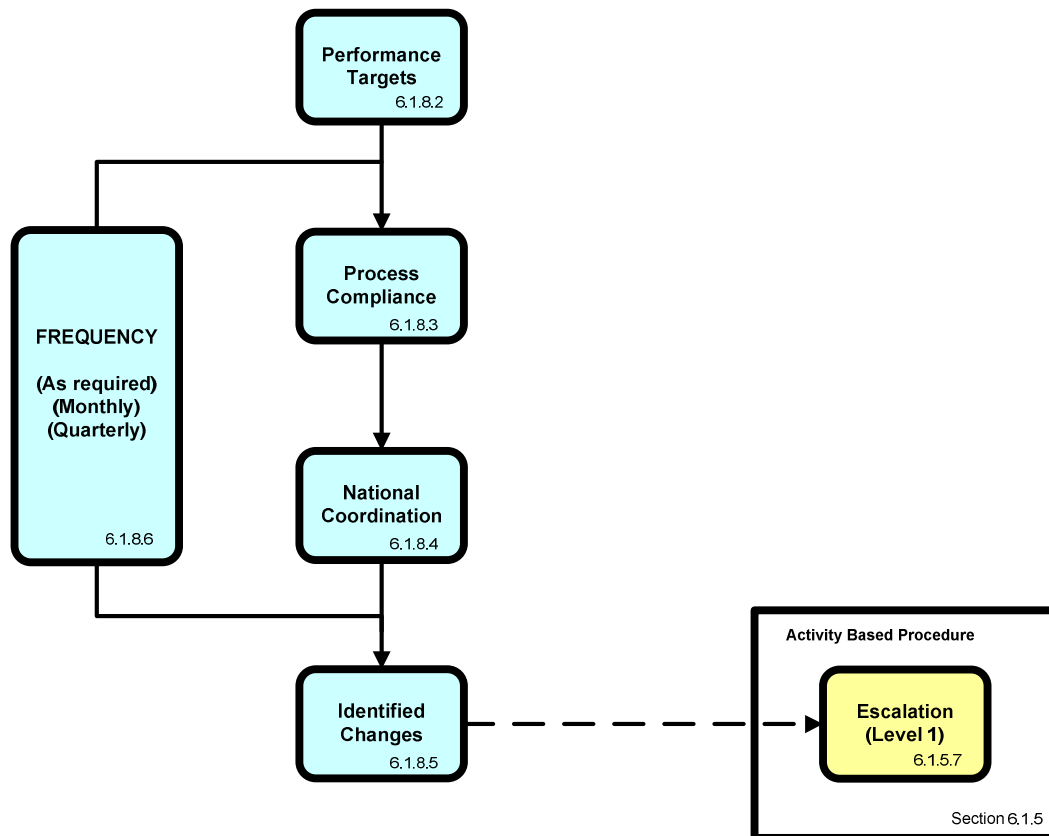
6.1.8 Assurance Procedure

6.1.8.1 Introduction

Assurance is primarily an external and independent view on the work the Service Managers and their Service Providers carried out as part of the Network Occupancy Management process

The Assurance Procedure is the responsibility of the Network Performance Manager and delivered by Network Access Manager within the regional Network Access and Resilience Team.

The following diagram depicts the elements of the Assurance Procedure.



6.1.8.2 Performance Targets

The Performance Targets are as described in Section 6.1.6.2 of this chapter.

6.1.8.3 Process Compliance

The Process Compliance requirement is to ensure that network occupancy management is being undertaken in accordance with the Network Occupancy Management process.

The Process Compliance will focus on the Service Manager's scrutiny process rather than the procedures of his Service Provider.

The Network Access Managers will report, through their NAR Team Leaders, to the Network Performance Managers on a regular basis. The report will specifically address the following:

- i. Implementation of the Network Occupancy Management process.
- ii. Development and application of the Network Occupancy Management Plan.
- iii. Deficiencies and departures from prescribed or agreed arrangements.
- iv. Summary of 'outcome' and other performance indicators.
- v. Summary of identified 'best practice'.

The report will make recommendations to the Network Performance Manager on any potential improvements that can be made to the management of network occupancy and will identify areas of 'best practice' that can be shared nationally.

Process Compliance is the responsibility of the Network Performance Manager.

6.1.8.4 National Coordination

National Coordination provides an overview of all activities that have a potential significant impact on the network at a regional or national level. That is those activities requiring extensive planning beyond adjacent areas or across multiple regions. These will be known as Nationally Significant Activities.

The Network Access Manager, acting on behalf of the Network Performance Manager will facilitate communication between the relevant Service Manager, The Regional Control Centres (RCCs) and the National Traffic Control Centre (NTCC).

The National Coordination role of the Network Access Manager does not remove any of the existing responsibilities from the Service Managers, the Network Operation Managers, the RCC, the NTCC or the Service Providers, but simply provides a strategic overview role. The role is to provide assurance to the Network Performance Manager that everything that can be done to minimise disruption arising from the activities on the network, has been done.

The Network Access Manager will keep a register of Nationally Significant Activities with individual activities normally being identified by the Service Managers (or their Service Providers) or by the Network Access Managers themselves. Network Access Managers will complete a plan for each 'Nationally Significant Activity'. This will provide details of consultations, considerations and actions as a result of liaison with key stakeholders, i.e. RCCs, NTCC, LHAs, emergency services, representative bodies and the media. A template is attached in Annex 6.1.3 which sets out a suggested structure for managing a Nationally Significant Activity.

National Coordination is the responsibility of the Network Performance Manager.

6.1.8.5 Identified Changes

The assurance procedure itself may result in the identification of a need to change occupancy configuration.

The Network Performance Manager is responsible for identifying any potential changes required as a result of the assurance procedure. The Network Performance Manager will inform the Service Provider who must initiate the Escalation (Stage 1) element of the Activity Procedure.

6.1.8.6 Frequency

The Assurance procedure should be undertaken on a pre-defined frequency set down by the Network Performance Manager. This regime should be established taking into account the guidance provided in this section.

Suggested Regime

The following table summaries the suggested regime undertaken by the Network Performance Manager as part of their assurance responsibilities.

Frequency	Typical Scope
As required	National coordination of Nationally Significant Activities as and when identified.
Monthly	Examination of deficiencies and departures from prescribed or agreed arrangements and examination of Network Occupancy Management Plans on a regional basis.

Frequency	Typical Scope
	Production of a compliance audit report and submission to the Network Performance Manager.
Quarterly	Examination of the 'outcome' and other performance indicators and examination of Network Occupancy Management Plans on a regional basis.

6.1.9 Mitigating Delays Arising from Street Works

6.1.9.1 Introduction

The Highways Agency is under a duty to manage its network and to ensure delay arising from all activities is minimised. The Highways Agency imposes on itself a strict regime of occupancy management with road user delay being a key consideration in the planning of its own works. The principles applied to the management of the Highways Agency's own works should be broadly applied to the works of all third parties, including utility companies' street works.

This sub-chapter sets out guidance on the Highways Agency's policy on the general approach to the use of specific powers under section 56 and section 66 of the New Roads & Street Works Act 1991 (NRSWA). It does not however set down any detailed arrangements or define the procedures for use of these powers. The detailed requirements, as defined in the secondary legislation and Codes of Practice (particularly *Co-ordination of street works and works for road purposes*), should always be followed. Further guidance and assistance is available from the Highways Agency's Network Management Policy team within the Safety Standards and Research Directorate. Codes of Practice are available for download on the [DfT web site](#).

6.1.9.2 Coordination and Co-operation – Longer Term Planning

The Highways Agency has a specific duty, under Section 59 of NRSWA, to coordinate works of all types. As part of its network occupancy management arrangements, see 6.1.5.3, 'provisional' bookings are generally made at least one year in advance and 'firm' bookings are generally made at least three months in advance. These timescales have been set so that all activities on the network can be effectively coordinated and any potential disruption to road users can be mitigated.

Statutory Undertakers are required to provide the minimum notice periods as defined in the NRSWA '*Notices, Directions and Registers Regulations*'. These minimum notice periods fall significantly short of the Highways Agency's own requirements for booking road space. Undertakers are not obliged to provide anything more than the legal minimum notice however they should be encouraged to provide longer notice on a 'best endeavours' basis.

Statutory Undertakers have a duty, under section 60 of NRSWA, to co-operate with the street authority and this extends to providing advance information on planned works as detailed in the statutory Code of Practice on coordination. Clearly where an Undertaker has no advance knowledge of his works he cannot be expected to provide information on those works. The statutory Code of Practice, which Undertakers must follow in discharging their duty to co-operate, clearly states that the notice periods should be treated as a minimum. The document states that "*works promoters are encouraged to give longer periods than the basic minimum in order to ensure that all street authorities have the capability to consider all proposed works, their effect upon traffic disruption, as well as any conflict with other street works or road works*".

Service Providers must work to ensure that Statutory Undertakers provide advance information of works in the timescales defined in the network occupancy management arrangements, see 6.1.5.3. Where Statutory Undertakers fail to co-operate they may be committing an offence under section 60 of NRSWA and the Service Provider must provide the Service Manager with the relevant details so that a prosecution may be considered.

Generally the telecommunication companies will not be able to meet this requirement however the water and gas utility companies have significant renewal programmes which they should be able to provide details of in the timescales suggested.

The giving of longer notice should always be actively encouraged but there may be occasions where consideration should be given to allowing an early start of works, particularly where there is a potential benefit to the road user in doing so.

6.1.9.3 Timing of Works – Power to Direct

The Highways Agency has the power, under section 56 of NRSWA, to direct an Undertaker to work at specified times of the day or on specified days. These directions can only be given where works have the potential to cause serious disruption to traffic.

When considering the use of directions under section 56 it is important to test the reasonableness of what is being considered. It would be considered reasonable to direct timings on the basis of the working time restrictions applicable to the Highways Agency's own works so, for example, if works are not allowed during peak hours, say between 06:00hrs and 10:00hrs and between 15:00hrs and 20:00hrs, it would be reasonable to direct an Undertaker not to work during these periods.

Another consideration is the interpretation of the meaning of 'serious disruption'. This term is used in the primary legislation however further guidance has not been provided in either the regulations or the Code of Practice. It is important to consider delay in the motorway and trunk road network in context with the local road network. For example, what might be considered to be a lightly trafficked road within the trunk road network could be one of the busiest roads when considered alongside the rest of the network in that locality.

Service providers must ensure, by the use of directions issued under section 56 of NRSWA, that Statutory Undertakers adhere to Highways Agency's working time restrictions. Where Statutory Undertakers fail to co-operate they may be committing an offence and the Service Provider must provide the Service Manager with the relevant details so that a prosecution may be considered.

Section 56 only relates to the timing of works. If it is considered that a particular traffic management is causing unnecessary delay, and it can be altered to reduce this delay without impacting on the safety of the operatives or the public, a direction under section 66 should be given (see 6.1.9.4 below).

New powers are shortly to become available under section 56(1A) and 56A of NRSWA. The new powers under section 56A will allow the Highways Agency to direct an Undertaker not to place apparatus in the street. The opportunities to use such powers are going to be rather limited however, where a potential use of the direction is identified, the Service Manager should be notified forthwith. The addition of subsection 1A to section 56 extends the power to issue directions to include subsisting works. Clearly there will be circumstances where making such directions would not be appropriate, for example ongoing emergency works. It should however be noted that section 66 could still be applied in these circumstances and therefore appropriate use should be made of this provision.

6.1.9.4 Avoidance of Unnecessary Delay

Statutory Undertakers have a duty, under section 66 of NRSWA, to “ . . . *carry on and complete the works with all such dispatch as is reasonably practicable.*”. Where street works are occupying road space on the trunk road and motorway network it is reasonable to expect that the utility deploys resources to work continuously until their works are completed and the road space is given back to use by the road user.

Service Providers must ensure that Statutory Undertakers are not executing works in such a manner that capacity on the Network is unnecessarily restricted. In particular, traffic management should not be in place unless works are actually being executed. Where a Statutory Undertaker fails to deploy sufficient resources on a job to ensure unnecessary delay is avoided the Service

Provider must issue a notice, under section 66 of NRSWA, requiring the Undertaker to take steps to avoid the delay or obstruction. Where Statutory Undertakers fail to respond to the requirements of a section 66 notice they may be committing an offence and the Service Provider must provide the Service Manager with the relevant details so that a prosecution may be considered.

There may be rare occasions where it is quite legitimate for traffic management to be in place when no works activities are being executed. The two specific examples are where gas needs to be vented from an excavation or a chamber and where materials cannot be trafficked until they have cured.

Where an Undertaker fails to respond to a section 66 notice the Highways Agency is entitled to intervene and take direct action to mitigate the disruption by, for example, backfilling or plating an excavation. In such circumstances all costs are recoverable from the offending utility company.

6.1.9.5 Other general considerations

A balanced and even handed approach should always be taken when dealing with Statutory Undertakers. Wherever possible, agreement should be reached on an informal co-operative basis. Full use of the powers available should however be made where a Statutory Undertaker fails to act in a co-operative manner.

Statutory Undertakers operate under strict regulatory regimes and, as public companies, work in a highly commercial environment. There will, understandably, be significant resistance to any impositions that result in increased costs. As long as the Highways Agency continues to act in a reasonable manner and takes a balanced view on the various considerations the commercial consequences on the utility companies should not be a concern. Under no circumstances should any discussion on compensation be entertained.

The powers under NRSWA discussed in this sub-chapter have been delegated contractually to Service Providers and should therefore be used by them. If however it is necessary, the powers can still be used directly by the Highways Agency. Legal notices should generally be issued by the Service Provider on the Highways Agency's behalf however the Highways Agency should manage any prosecutions that need to be pursued.

It is important to remember that Statutory Undertakers have a right to place their apparatus in the highway and to maintain it (unless of course the street has 'protected' status). Any actions taken in managing street works activities should be discharged in a reasonable manner and under no circumstances should a utility company be obstructed in carrying out its obligation to place and maintain its infrastructure.

6.1.9.6 Offences and Prosecutions

Where a Statutory Undertaker is considered to have committed an offence the Highways Agency may take forward a prosecution.

In managing street works activities, and particularly when using the powers available under section 56 and section 66 of NRSWA, Service Providers must work on the assumption that there is the potential need for a prosecution to be pursued. Service Providers must therefore ensure that legal procedures are followed rigorously and that evidence is collected at every stage in order to support a successful prosecution.

Further guidance on prosecutions will be made available to all Service Providers and Service Managers

6.2 Scheduled Road works (SRW)

6.2.1 Introduction to SRW

SRW is a system for the improved management of information about lane closures on the motorway and all-purpose trunk road network. SRW improves the accuracy, quality and currency of road closure information in order to help ensure that the Highways Agency Information Line (HAIL), the Highways Agency website, the Highways Agency Traffic Officer Services, the Highways Agency Regional Control Centres (RCC) and the National Traffic Control Centre (NTCC) meet customer requirements as well as providing a resource for network occupancy management.

Service Providers must enter the data directly into SRW and they and their colleagues in the Highways Agency are then able to report on the data loaded. In the case of Highways Agency staff, access is provided to all data in the system, whilst Service Provider staff will be restricted to information pertinent to their Areas. A principle of SRW is that only the Service Provider's can enter or amend data in SRW.

The information is used to compile network availability statistics for comparison with the Road Users' Charter targets and other KPI. Information from SRW is passed on to the Highways Agency public website regularly. It is therefore important that Service Providers endeavour to ensure that all information held in SRW is as accurate, complete and up to date as possible.

6.2.2 Accessing SRW

SRW, a module of HAPMS, is essentially a database of lane closure information held on a server at the Highways Agency. Service Provider users can access the database by logging into HAPMS in the usual way.

Service Providers must access HAPMS via their Highways Agency Extranet or ISDN connections. For information about using the Highways Agency connection Service Providers should, in the first instance, contact their own internal IT departments. Any requests for help in using SRW, including requests for training of new users, should be directed to the Highways Agency ServiceDirect helpdesk Telephone: 0113-2541140; E-mail: ServiceDirect@highways.gsi.gov.uk

6.2.3 What information to store in SRW

With the development of the Traffic Manager role within the Highways Agency, in accordance with the Traffic Management Act, the Highways Agency requires input of all closures - planned or unplanned, irrespective of the expected impact, is expected.

The classification of closures must be as defined below:

Severe	Estimated delay of over 30 minutes per vehicle at peak times
Moderate	Estimated delay of between 10 and 30 minutes per vehicle at peak times
Slight	Estimated delay of less than 10 minutes per vehicle at peak times
No Delay	Closures that are expected to cause no delay to road users

It is recognised that the effect of different closures will have a different impact on the travelling public and therefore Service Providers must provide information that is appropriate to the severity of the impact of the closure. Detailed Closure Record must be used to record required information when:

- Number of lanes closed/opened varies within different components (e.g. contraflows)
- Number of lanes closed/opened varies within the length of the closure
- Rolling/Mobile closures

- Layout varies over time – unless any lane closure is for only part of each day (e.g. overnight) and the period over which it is in place matches the standard HAPMS definition of peak, off-peak and/or night.

Summary Closure Records may be used in other cases.

All other closures may be entered using the 'Summary SRW closure entry route'. This applies to all planned and unplanned lane closures. Records must also be provided for off Network events that are considered to impact on traffic using the Highways Agency's Network.

The SRW user guide indicates the approved approach to the population of SRW records. The user guide is available on the HAPMS on-line documentation pages ([//bms.partnernet.highways.gov.uk/hapms](http://bms.partnernet.highways.gov.uk/hapms)) or on request from the HAPMS Support Team via ServiceDirect (as indicated above).

6.2.3.1 Terms of Reference

The term “**planned lane closure**” is used herein to refer to traffic management modifying the normal flow of traffic in relation to works planned by the Service Provider to undertake their normal activities on the Network. These include all items of routine and non-routine maintenance, refurbishment and construction but does not relate to works being performed to rectify damage to infrastructure as the result of an incident although some more extensive repairs may be the subject of programmed activities

The term “**incident lane closure**” is used herein to refer to unplanned lane closures directly resulting from an incident on the Network. Incidents normally involve road traffic collisions, disabled, damaged or abandoned vehicles, obstructions in the carriageway, or significant unplanned roadside events that are causing disruption to the normal flow of traffic. Incident recovery is managed by the Service Provider, or by the Highways Agency's Traffic Officer Service (e.g. RCCs) or by the Police or Local Highway Authority with or without the support of the Service Provider. The duration of the incident is considered to be from the time of the incident itself until the time at which the site is vacated by all personnel from the emergency services, vehicle recovery agents, Highways Agency or the Service Provider.

The term “**emergency lane closure**” is used herein to refer to lane closures put in place by the Service Provider to make safe or make repairs to damage resulting from an incident on the Network. Emergency lane closures may run continuously from the end time of an incident (for example, if lanes have remained closed from safety reason after the departure of all personnel) or may occur at a discrete period some time after the end time of an incident (for example, the Service Provider plans later lane closures to make repairs to infrastructure).

6.2.4 Information Exchange with the National Traffic Control Centre & the Regional Control Centre

The key requirements for information provision to NTCC and the appropriate RCC (in charge of the Highways Agency Network in the area of the road works) are outlined below. The information must be accurate which will require actual times being recorded.

6.2.4.1 Planned lane closure information

The Service Provider must enter accurate, complete and up-to-date lane closure data into the Highways Agency's Scheduled Road works System (SRW). Note that the NTCC and RCC operate on a 24/7 basis and “up-to-date” information in this context means that the Service Provider must

enter all new or changed data into SRW system as soon as is practicable and in any case within 24 hours of any required input or known change.

6.2.4.2 Real-time lane closure updates (planned and emergency lane closures)

This refers to the estimated completion time of lane closures anticipated to finish ahead of or behind the previously scheduled time. This information must be provided to NTCC and relevant RCC in “real-time” as soon as the Service Provider is aware of a likely change using means as agreed within the working arrangements. In any case, for overrunning works this notification must occur prior to the originally scheduled completion time; for early-completion this must occur prior to the new expected completion time.

The Service Provider must provide this information according to the following criteria, which have been developed to minimise unnecessary workload on the Service Provider:

Time of Day	Notifications required	
06:00 hrs to 19:00 hrs	if there is any change of more than 15 minutes to the notified plans for either commencement or removal of traffic management	
19:00 hrs to 00:00 hrs	when removal of planned traffic management is delayed by more than 30 minutes from the time notified	
00:00 hrs to 06:00 hrs	when traffic management due for removal after 06:00 hrs is delayed by more than 15 minutes from the time notified	
24 hours	when lane closures have been booked but this closure booking will not be used.	

For overnight works the provision of this information will require “out-of-hours” communication from the Service Provider to NTCC and relevant RCC. The means by which this is done, and the personnel involved, will be agreed between NTCC, the relevant RCC, the Service Provider and the Area Performance Team representative.

NTCC and the relevant RCC may also need to confirm details of real-time updates where, for example, the information provided is unclear. In such cases the Service Provider must provide contact name(s) and telephone number(s) of whomever who can supply such updates. NTCC will also provide details of NTCC and RCC personnel in the event that the Service Provider needs to initiate discussion.

6.2.4.3 Incident Lane Closures

Where the Service Provider is required to provide lane closure and other traffic management or other services directly, or in assisting the emergency services in the management of an incident, and/or the undertaking of work to render the road safe for further use, the Service Provider must notify the National Incident Liaison Officer (NILO) in accordance with existing incident reporting procedures. NTCC and appropriate RCC will be informed of incidents by the NILOs.

6.2.4.4 Emergency Lane Closures

Where the Service Provider is required to provide traffic management to undertake unscheduled emergency works, the Service Provider must notify the NTCC and the RCC by means agreed in the working arrangements.

6.2.4.5 Other real-time events

The Service Provider must supply details of anticipated or actual consequences of severe weather affecting lane availability or vehicle speeds (e.g. flooding, winter weather) and any other events that can reasonably be expected to affect any part of the Network managed by the Service Provider.
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6.2.4.6 Records of actual lane closures

To ensure accurate record keeping the Service Provider must create or update records within SRW reflecting the actual times, lanes closed and location etc for all lane closures within 72 hours of their removal from the road.

6.3 Temporary Traffic Signs - Special Events

6.3.1 Introduction

This refers to granting permission for the Automobile Association, and others to erect temporary signs on the Network to notify of special events.

6.3.2 Policy

Current policy is set out in the Department of Transport Network Management Advisory Leaflet entitled "Provision of Temporary Traffic Signs to Special Events", dated May 1993 (revised 2008). Interpretation of Note 2 on page 5 of this document is that, in the case of motorways, agreed temporary signs must be erected by the Service Provider. On other trunk roads, however, there is no reason to prevent other reputable organisations from carrying out the work providing they comply with the requirements in the leaflet.

A code of practice for the erection of temporary traffic signs to special events is included in Annex 6.3.1.

6.4 Decriminalised Parking

6.4.1 Introduction

Under Section 43 of, and Schedule 3 to, the Road Traffic Act 1991 Local Authorities are empowered to ask the Secretary of State to make Orders that create areas within which the enforcement of non-endorsable on-street parking offences may be decriminalised. These are called Permitted Parking Areas or Special Parking Areas. In them police enforcement is replaced by parking attendants who raise penalty charges which are civil debts, recoverable by the Local Authority.

These proposals may apply to all purpose trunk roads. They do not apply to Clearways, Red Routes or Motorways where breaches of the parking restrictions remain criminal offences. The Highways Agency has no powers to initiate such proposals.

6.4.2 Policy

The procedures require Local Authorities to consult the Highways Agency. Should Highways Agency Area Performance Teams become aware of any consideration being given to any such proposals they should refer to Department of Transport Circular 1/95 entitled "Guidance On Decriminalised Parking Enforcement Outside London" which is published by The Stationery Office and may also be downloaded from the Department for Transport's website. Experience to date suggests that this is not a pressing issue at the moment and that a single copy of the Circular held in the Service Provider's library will be sufficient.

6.5 Abnormal Load Routeing and Management**6.5.1 General**

6.5.1.1 The routeing of Abnormal Indivisible Loads on the Network is managed by the Highways Agency's Abnormal Indivisible Loads (AIL) Team. Abnormal Indivisible Loads are those which cannot, without undue expense or damage, be divided into two or more loads for the purpose of carriage on the Network. The movement of these loads is governed by Regulations, including the Road Traffic Act 1988, and DMRB standards BD86 and BD21. Guidance, and instruction, on the AIL Special Order Process Improvements was provided to Service Providers by AMM 106/08. Associated policy mandated by that document is included in this chapter, see 6.5.1.1 and accompanying Annexes.

6.5.1.2 BD86 gives guidance for the determination for Vehicle Ratings and Reserve Factors for highway bridges and structures that indicate the load carrying capacity of structures to support Special Type General Order (STGO) and Special Order (SO) vehicles. BD86 is used in conjunction with BD21 which refers to the Authorised Weight (AW) Regulations, and should be utilised for the routeing of abnormal or indivisible loads on the Network.

6.5.1.3 The categorisation of road vehicles is included in BD86 but they have been reproduced here for ease of reference:

(a) Vehicles complying with The Road Vehicles Construction and Use (C&U) Regulations and Authorised Weight (AW) Regulations.

This group includes cars, light good vehicles, and rigid and articulated heavy goods vehicles up to a gross weight of 44 tonnes. These vehicles are covered by the C&U and AW Regulations and are not subject to permit and notification requirements. The effects of these vehicles are assessed in accordance with BD21.

(b) Vehicles complying with The Road Vehicles (Authorisation of Special Types) General Order (STGO Regulations).

This group includes vehicles that do not comply with the AW Regulations such as those used for the carrying or drawing of abnormal indivisible loads. Notifications of movements of these vehicles are required in accordance with STGO Regulations.

(c) Special Order (SO) Regulations.

This group includes vehicles that do not comply with the AW or STGO Regulations and is covered by Section 44 of the 1988 Road Traffic Act.

6.5.2 Abnormal Indivisible Load Special Order Process

6.5.2.1 There are three stages to the process as follows:

- Stage 1: SO Consultation Stage – BE 16 Application Approval
- Stage 2: 5 Day Notification Stage
- Stage 3: SO 60 Minute Notification Stage

Process flow charts detailing the roles each of the stakeholders, including Service Providers, discharges for Stage 1 to 3 are included at Annex 6.5.1 to 6.5.3 respectively.

6.5.2.2 The roles of the Service Provider, which he must assume and discharge, are further explained in paragraphs 6.5.2.3, 6.5.2.4 and 6.5.2.5.

6.5.2.3 Stage 1: SO Consultation Stage – BE 16 Application Approval:

Process Stage	Role	Responsibility	Timescale
Stage 1: SO Consultation Stage BE 16 Application Approval	To receive provisional SO route information from AIL Team via electronic AIL postbox.	Service Provider must have a predetermined electronic AIL postbox in operation to allow the receipt and passing of SO information to the AIL Team.	6 weeks
	To assess provisional load against structural capacity along the proposed SO route.	Service Provider must undertake structural capacity assessment along the proposed SO route in accordance with BD86 or as otherwise agreed with the Highways Agency Technical Approval Authority (TAA).	
	To provide the AIL Team with comments on any potential road space booking or network occupancy conflicts.	Service Provider must assess the provisional SO route and timeframe using Scheduled Roadworks (SRW) as well as any other available source of network information.	
	To return all comments following structural assessment and occupancy checks to the AIL Team.	Structural assessments and occupancy checks must be completed by the Service Provider within timescales prescribed by the AIL Team. All comments must be returned (including nil returns) to the AIL Team by e-mail.	
	Identify any need for detailed structural assessment or Technical Approvals	Service Provider must: Inform the AIL Team of the requirement for additional technical approval at the soonest opportunity; provide information as to type of assessment or approval required as well as approximate timescale implications, and; administer detailed assessments or Technical Approvals on behalf of the haulier in accordance with existing procedures.	Up to 10 weeks*
	Provide any further assistance or information as requested by AIL Team	Service Provider must respond to requests as soon as reasonably practicable and must provide any assistance according to AIL Team request	Task dependant
	Take receipt and file all approved SO permit and route information	Service Provider must receive SO permit and route information via electronic AIL postbox and must file all information in accordance with existing procedures to facilitate future reference.	2 days*

* timescales will vary

6.5.2.4 Stage 2: 5 Day Notification Stage

Process Stage	Role	Responsibility
5 Day Notification Stage	Should a Service Provider receive a 5 Day Notification Stage directly from a haulier they are to advise the National Traffic Control Centre (NTCC) at their soonest possible opportunity	The Service Providers must provide the NTCC with all haulier 5 Day Notification information.
	To receive 5 Day Notifications from NTCC via electronic AIL postbox.	Service Provider must have a predetermined electronic AIL postbox in operation to allow the receipt and passing of SO information to the NTCC.
	To review current structural capacity along the approved SO route	Service Provider must undertake structural capacity review along the approved SO route. Load capacity assessments of structures for proposed SO vehicle movements, other than those using ESDAL screening, must be subject to Technical Approval procedures in accordance with BD2.
	To return all comments following structural assessment to the NTCC.	Service Provider must complete structural assessments checks within timescales prescribed by the NTCC and must return all relevant comments (including nil returns) to the NTCC by e-mail
	To provide the NTCC with comments on any road space booking or network occupancy conflicts	Service Provider must review the approved SO route and timing against current Scheduled Roadworks (SRW) entries as well as any other available source of network information. The Service Provider must also complete road space occupancy checks within timescales prescribed by the NTCC and must return all relevant comments (including nil returns) to the NTCC by e-mail. This role and responsibility will reside with the Service Provider until such time that they are advised by the Service Manager that a formal handover to the RCC has been agreed
	To create an SO movement related Event (X) entry in SRW	Service Provider must include all relevant SO movement details to SRW . The HA SO permit number must be entered into a SRW field that can be viewed by the NTCC for referencing purposes. Any ongoing management and update of SO SRW entries must be done in accordance to existing procedures.
	Provide any further assistance or information as requested by the Area Performance Team (APT).	Service Provider must respond to requests as soon as reasonably practicable and must provide any assistance according to Service Manager requests.

6.5.2.5 Stage 3: 60 Minute Notification Stage

Process Stage	Role	Responsibility
60 Minute Notification Stage	Provide any further assistance or information as requested by the Regional Control Centre (RCC).	Service Provider's Network Control Centre (NCC) (or equivalent) must respond to requests as soon as reasonably practicable and must provide any assistance according to RCC requests.

6.5.3 Detailed Structural Assessments and Technical Approval

6.5.3.1 The effects of STGO vehicles must be assessed in accordance with BD86.

6.5.3.2 For SO Vehicle Movements the following requirements apply unless expressly stated otherwise in the Service Provider's contract:

- (i) Load capacity assessments of structures for proposed vehicle movements, other than those using ESDAL screening, must be subject to Technical Approval procedures in accordance with BD2.
- (ii) The Service Provider must provide an estimate of the costs of assessment of structures for route clearance to the Service Manager.
- (iii) The estimate of cost of assessments of structures will be forwarded by the Service Manager to the haulier applying for a route for a SO vehicle movement. A suitable letter template is included at Appendix 6.5.2. The Service Manager will advise the Service Provider to undertake the assessments once confirmation has been received by the Service Provider that costs will be met by the movement route applicant.
- (iv) The haulier will be given a copy of the Assessment certificates for Load Assessments for which he has paid.
- (v) On completion of appraisal of the route for a proposed SO Vehicle movement the Service Provider must notify the AIL Team of the suitability of the route using the form at Appendix 6.5.1 of this manual.

6.5.4 Electronic Service Delivery for Abnormal Loads

6.5.4.1 The ESDAL website is designed to help haulage companies plan their journeys when moving abnormal loads. The website has been developed for the Highways Agency by Serco Integrated Transport and is designed for all parties involved in moving abnormal loads.

6.5.4.2 Phase 1 of ESDAL offers an on-line mapping system to plan their route, and will automatically generate an up-to-date list of the authorities they need to contact. These easily identifiable contacts will ensure more accurate notifications, safer movements and help to simplify the current system. A further three phases will be introduced to the website in due course. These will streamline the process for the police and relevant authorities who ensure that the proposed route is suitable, taking account of the impact on traffic and bridges to be used, to manage notifications.

6.5.4.3 The planning service is free and those who wish to find out more about ESDAL, or register their details online, should visit the website: www.esdal.com

Appendix 6.5.1

SPECIAL ORDER MOVEMENTS

Notification of suitability of route with respect to the load capacity of structures.

HA reference:

Maintenance Area:

Movement reference/name:

Description of route in Area:

Description of Vehicle Train considered: *[may be attached as a separate sheet – this would include wheel layout of the vehicle train, gross weights of vehicle and tractors, tyre contact areas, wheel and axle weights, etc]*

Results of Assessment: *[list all structures affected by the route]*

Structure Name	Structure Number	Pass/Fail	Comments
			[Include date of assessment, note of critical elements, any cautions/conditions that apply. These might include vehicle speed, coincident loads, position of vehicle on carriageway etc]

I confirm that the above assessments have been carried out in accordance with HA procedures including those for Technical Approval.

The vehicle may pass* / not pass* over this route subject to any conditions in the comments for each structure *[* delete as appropriate]* and subject to the general cautions and conditions given below:

[List all comments / cautions / conditions that apply generally to the proposed route]

Signature:

Bridge Manager

Name:

Date:

Service Provider:

NOTES

- 1 This form is to be completed by Service Provider.
- 2 The above results only apply to the movement being considered based on the assessment standards and the condition of the structure at the time this movement request was considered and other conditions noted against each structure. No assumptions shall be

made regarding any similar movements along this route, which will each require a further application for agreement.

- 3 This form shall be faxed and posted to the Regional HA Abnormal Indivisible Loads Administrator/Network Access and Resilience Team for the Area concerned.
- 4 The Highways Agency's Abnormal Indivisible Loads Administrator shall attach this form to the Weight Certificate required by HA internal procedures before submitting it to the Service Manager for signature.
- 5 The Bridge Manager is the person named in the Service Provider's QA procedures as responsible the management of all structures within the Network

Appendix 6.5.2**Standard text of letter to be sent to Movement route applicant by the Highways Agency**

Dear Sir,

[Insert here the unique name by which the abnormal load movement is known]

STRUCTURAL ASSESSMENT COSTS FOR AREA [Insert HA Area Number or DBFO details]

Set out below the terms on which the Highways Agency are prepared to instruct *[Name of Service Provider]* to carry out the bridge assessments described in the Schedule attached hereto associated with the Special Order movement referred to above.

1. *[Name of Company (the Movement route applicant)]* will pay all costs, howsoever arising, incurred by *[Name of the Maintenance Service Provider]* on behalf of the Highways Agency in connection with the carrying out the bridge assessments including administrative and professional costs and any value added tax. *[Name of Company (Movement route applicant)]* will on accepting the terms of this letter pay an estimate of the costs in the sum of £[.....] to the Highways Agency within 14 days of the date of this letter.
2. On completion of the assessments *[Name of the Maintenance Service Provider]* will certify the costs incurred and, if the sum certified exceeds £ ----.-- *[Name of Company (Movement route applicant)]* will pay the Highways Agency the difference within 14 days of the date of the certificate, but if the sum certified is less than £ ----.-- the Highways Agency will refund the difference to *[Name of the Company (Movement route applicant)]* within that period.
3. The certificate of costs provided in accordance with paragraph 2 above shall be final, unless an error by the Maintenance Service Provider is shown to have been made.

I shall be grateful if you would indicate *[your company's or the Company's]* acceptance of the foregoing terms by signing and returning to me the enclosed copy of this letter with the attached schedule and plan / drawing.

Yours faithfully

[Name of Company (Movement route applicant)] hereby accepts the terms and conditions set out in the above letter and requests the *[Name of the Maintenance Service Provider]* acting on behalf of the Highways Agency to carry out the assessments.

Signed

Director

Date

Schedule

The assessments comprise *[List the assessments to be undertaken by the Service Provider]*

1.....

2.....

3.....

6.6 Co-ordination of Design and Works

6.6.1 Introduction

The purpose of this chapter is to set out how co-ordination of motorway widening and essential carriageway and bridgeworks can be achieved effectively and efficiently. It sets out the responsibilities of the widening consultant/designer, the Highways Agency's Service Provider and the Highways Agency. Whilst the guidance given is intended to be normally applicable, there may be exceptional circumstances which dictate that a different approach is necessary. Such cases should be referred to Highways Agency for approval.

6.6.2 General Approach

The objective should be to ensure that, where the opportunity exists, maintenance works should be combined with motorway widening in order to minimise the impact on road users. Congestion at road works involves very large delay costs and can result in considerable frustration for drivers. Therefore, as soon as possible in the preparation of a widening scheme, Highways Agency will determine the maintenance works to be included in widening contracts. The intention should be to avoid undertaking major capital maintenance works which would cause significant traffic disruption or abortive work in advance of a widening contract involving works on the existing carriageway/structures. Furthermore, the design of a widening scheme incorporating existing carriageways/structures should be normally sufficient to ensure that there is no necessity to carry out maintenance works any sooner than normal maintenance cycles would suggest following completion of the widening works.

The consultant/designer and Highways Agency will be responsible for implementing these combined widening and maintenance contracts.

There should not be many exceptions to this approach. Such exceptions may occur where unexpected rapid deterioration of the carriageway or a structure leads to the need for immediate work to avoid unacceptable risks to the safety of the public. Such exceptions may also occur where the requirement to accommodate 40T lorries before 1999 dictates that bridges must be strengthened in advance of widening.

The consultant/designer will be responsible for the design of the maintenance works on the carriageways and structures on the section of motorway covered by his commission. This should include any upgrading or steady state maintenance as defined in Part 4, of those structures which will not be demolished or substantially altered.

Throughout the duration of the widening commission there will be an ongoing need for liaison and the exchange of information between the consultant/designer, Service Provider and Highways Agency. Regular formal co-ordination meetings may be the most effective method of ensuring such liaison. Subject to the agreement of Highways Agency, the Service Provider may be requested to advise the consultant/designer on maintenance options and treatments but such advice, if accepted, will not relieve the consultant/designer of his responsibilities for the permanent works. The Service Providers costs in providing this advice will be reimbursed.

6.6.3 Prior to Appointment of Consultant/Designer

In drawing up programmes of maintenance work, Highways Agency will take account of any motorway widening schemes for which a consultant/designer has not been appointed. Even at this early stage, the aim will be to co-ordinate widening with maintenance, as far as this is practicable given the uncertainty over the proposals and programme for the widening.

Highways Agency will ensure that the brief for the widening commission covers the collection of maintenance data and any maintenance activities likely to be required by the consultant/designer.

6.6.4 On Appointment of Consultant/Designer

Highways Agency will notify the Service Provider in writing of the award of the commission, the name of the consultant/designer, the Project Manager (PM) and that of the Highways Agency's PM.

One of the consultant/designer's first tasks after having been awarded a widening commission is to identify, and to carry out a preliminary appraisal of widening options. To enable realistic maintenance costs to be included in economic assessments, the consultant/designer will need to form a broad view of future maintenance requirements. To enable the consultant/designer to do this, the Service Provider should provide within eight weeks of a request by the consultant/designer a short report, via Highways Agency, on the general condition of the carriageways and structures. A guide to the content of the report is included at Annex 6.6.1. The Service Provider's costs in supplying this information will be reimbursed.

6.6.5 Scheme Appraisal and Design

Throughout the preparation period for a widening scheme the Service Provider should continue to carry out all routine maintenance including routine technical surveys and bridge inspections. Drainage systems should be proved where this has not already been done. The data from the surveys should be provided by the Service Provider to the consultant/designer on request to enable the consultant/designer to refine or modify his appraisals as necessary. For providing this information to the consultant/designer only the Service Provider's costs which are not part of his normal duties under his Contract with the Highways Agency will be reimbursed.

If the consultant/designer wishes to carry out detailed surveys, inspections and tests of his own, he should inform Highways Agency and the Service Provider of his intention to ensure that no party duplicates the work of the other. If the consultant/designer's requirements could most effectively be carried out by the Service Provider (e.g. an additional deflectograph survey) and the Service Provider is able to accommodate the requirement within his own survey/inspection programme, then appropriate arrangements should be made through Highways Agency. The Service Provider's costs in carrying out this work when not part of his normal duties under his Contract with the Highways Agency will be reimbursed. If the consultant/designer's requirements cannot be accommodated by the Service Provider or if the surveys are of a specialist nature and beyond the Service Provider's capabilities, then a specialist testing consultant or contractor should be employed and the costs will be reimbursed. In both cases, the results of the surveys, inspections and tests should be exchanged between the Service Provider and consultant/designer, if required.

If the consultant/designer proposes to undertake his own surveys, inspections and tests, he should inform Highways Agency and the Service Provider, to enable the Service Provider to comment on the proposals, methods of working and reinstatement. The consultant/designer will be responsible for ensuring that the work is undertaken in a safe manner and that the integrity of the carriageways and structures is not compromised. The consultant/designer should be informed before the works commence that if, in the opinion of the Service Provider, the works or any consequential reinstatement present an immediate danger to the public or the workforce the Service Provider will notify the consultant/designer and if no immediate action is taken the Service Provider will enter the site and execute any works necessary to remove the danger and make the site safe. If the Service Provider is dissatisfied with the conduct of the works but there is no immediate danger to the public or workforce, he should notify the consultant/designer (copy to Highways Agency) so that appropriate action can be taken. The consultant/designer should supervise any reinstatement required to the satisfaction of the Service Provider and formally hand over to the Service Provider.

6.6.6 Arrangements for Major Widening and Maintenance Contracts

Once the maintenance works to be included in the widening contract are known, Highways Agency

will formally seek the agreement of the Service Provider to the temporary withdrawal of responsibilities for the design and supervision of those works. A model letter for this purpose is at Annex 6.6.2. This letter should be sent in sufficient time to serve notice in the event of a disagreement.

The consultant/designer should ensure that the design of the permanent works takes account of the need for future maintenance and that any easements required for maintenance purposes are included in the Compulsory Purchase Order.

Where appropriate, the consultant/designer should discuss with Highways Agency and the Service Provider the effect of his proposals on the motorway maintenance compounds and the arrangements for winter maintenance. The objective should be to ensure that an efficient maintenance operational capability is maintained at all times. Where a compound needs to be extended or resited because of a widening scheme, this should be completed as an advance contract or substitute facilities provided before the effectiveness of the existing facility is impaired.

The consultant/designer should liaise with the Service Provider over the location referencing of that section of motorway affected by the widening scheme. This will enable the consultant/designer to produce, at the time of tender invitation, the drawings and schedules defining the Network as required by Part 6.

Prior to the preparation of the contract documents, Highways Agency will decide the respective responsibilities of the Contractor and the Service Provider during the contract, to enable appropriate clauses to be included in the widening contract documents. The Contractor should normally be responsible for routine maintenance within the site area and the Service Provider should be responsible for winter and electrical maintenance. The site area will need to be very carefully defined (e.g. from marker post to marker post, or from start of the traffic management taper to the 'End' sign), and reference made to the Contractor's duties for routine maintenance requiring him in this respect to fully comply with the relevant Codes of Practice.

6.6.7 Assessment and Strengthening of Structures

The 15 year bridge rehabilitation programme requires inter alia trunk road structures to be assessed and, if found to be necessary, strengthened before 1999.

Service Provider's are generally responsible for implementing the programme, except that the consultant/designer should be responsible for structures in motorway widening schemes which can be strengthened before 1999. In these circumstances the consultant/designer should assess and where necessary design strengthening for structures to be retained in his final scheme. The consultant/designer should comply with full technical approval and Highways Agency certification and reporting procedures in accordance with BD2 and DMRB Vol. 3 Section 4.

The consultant/designer must also provide Highways Agency with a copy of all appropriate assessment documentation. Highways Agency and the Service Provider should be informed of the consultant/designer's assessment programme as early as possible. This will ensure, not only that duplication does not occur but also that Highways Agency and the Service Provider are in a position to respond quickly and effectively if urgent measures are found to be necessary. In the report on the condition of the carriageway and structures, the Service Provider will have identified those structures already assessed in accordance with Part 4 and provided a copy to the consultant/designer of the results of the assessment and an outline of any strengthening works undertaken or proposed.

All structures not appraised by the consultant/designer should be assessed normally by the Service Provider, except where it is known that a structure will be demolished or substantially altered before 1999. The Service Provider should also be responsible for any interim measures which may be

necessary and all strengthening works except those which Highways Agency has notified will be incorporated into a widening scheme and completed before 1999. If such incorporation is planned, but the widening scheme is subject to slippage so that the strengthening of the structure would not be completed before 1999, Highways Agency will need to determine the most appropriate course of action in the circumstances. Options include passing responsibility back to the Service Provider, carrying out the strengthening as an advance contract to the widening scheme or the imposition of a temporary weight restriction.

6.6.8 During the Contract

On receipt of the programme from the contractor Highways Agency will notify the Service Provider of the timescale for the works and keep them informed of dates of closures and restrictions.

During the contract responsibility for any routine inspections, and all routine maintenance within the site area, shall pass to the Contractor who will be required to comply fully with the Routine & Winter Service Code and this Manual. This work will be specifically identified and included in the tender documents. Whilst the Highways Agency will remain legally responsible for the condition of the highway, and therefore for dealing with third party claims, compensation for breach of contract may be obtainable from the Contractor if he has failed to carry out adequately his routine maintenance responsibilities.

As part of his routine maintenance functions, the Contractor will be responsible for dealing with accidents and incidents within the site area, including the clearance of debris in co-operation with the police as required. In some cases, the Project Manager, after consulting the Contractor, consider it appropriate to call upon the Service Provider to assist with specialist operations. The Service Provider will be reimbursed for such assistance.

In addition to assuming the highway maintenance responsibilities described in the Routine and Winter Service Code, the Contractor will be required to keep the trafficked carriageways, throughout the length of the site, clear of debris, from whatever cause, as far as this is reasonably and safely possible. This requirement should be detailed in Appendix 1/17 of the Specification for Highways Works, using the following wording at section (ii) "Highways" under the heading "Maintenance Requirements".

"Until the issue of the Certificate of Completion, the Contractor shall be responsible for the maintenance in all respects (except of lighting columns, associated cabling and other electrical installations) of all lengths of highway within the limits of the Site in accordance with the Highways Agency's Routine and Winter Service Code. In addition to these requirements, the Project Manager will require the Contractor to inspect the trafficked carriageways and central reservation throughout the length of the Site at least once every hours and remove all debris however arising, either at the time of inspection or as soon thereafter as it is safe to do so having due regard both to the protection of workforce and of the travelling public from unreasonable danger. The Contractor will not assume responsibility for winter maintenance throughout the length of the Site".

Responsibility for electrical and winter maintenance throughout the contract period should remain with the appropriate Service Provider. Where appropriate, and before the onset of severe winter weather, the Service Provider should liaise directly with the Contractor in order to agree areas of the site into which snow may be ploughed or blown, if necessary. Such agreements should be reviewed as necessary in the light of progress with the work on site. In the event of a failure to reach agreement, the Service Provider should immediately inform Highways Agency who will need to determine the most appropriate course of action in the circumstances bearing in mind that effective winter maintenance must be carried out.

The Contractor shall allow reasonable access for specialist electrical contractors and others who require to attend to equipment not included in the main contract.

Prior to sectional completion Highways Agency will arrange a handover meeting and inspection of the works with the Service Provider.

6.7 NRSWA - Recovery of Inspection Fees from Statutory Undertakers**6.7.1 Introduction**

Under Section 72 of the New Roads and Street Works Act 1991 a Highway Authority is empowered to carry out investigatory works to check on whether or not an Undertaker has complied with the duties placed on it in respect of reinstatement of the street. If the reinstatement is found to be substandard, Section 72 makes provision for inspection of the remedial works at three stages, at the Undertaker's expense. Under Section 75 an undertaker executing street works is required to pay the Highway Authority a prescribed fee in respect of each sample inspection of works carried out by the authority. The fees under Section 75 do not apply to investigatory works under Section 72.

Full details can be found in "Code of Practice for Inspections" published by The Stationery Office.

It is essential for Area Performance Teams and Service Providers to have a copy of the Code of Practice (ACoP) and familiarise themselves with the contents. Further advice for the Inspection of Statutory Undertaker's Works is provided in Annex 6.7.1 and includes advice on undertaking sample, routine, investigatory, defect and inadequacy inspections, and the collection of fees. Further advice may be found in the Highways Agency's document 'NRSWA Act 1991 Good Practice Guide for Area Teams and MACs'.

6.7.2 Guidance

There are two strands to charging potential:

- inspections and
- works

6.7.2.2 Inspections

Dealing with inspections first, there are three distinct sub strands (i) sample, (ii) defect and (iii) investigatory

- (i) Sample inspection, the CoP for Inspections gives a detailed explanation of how this regime applies. The charging rate per inspection is determined by a Statutory Instrument – Street Works (Inspections Fees) (England) (Amendment) Regulations, which are amended annually for inflation.
- (ii) Defect inspections derive from the sample, inspection procedure, investigatory works, or routine highway inspections. Although these fees are not set by regulation the Highways Authorities Utilities Committee (HAUC) recommends that the fee should be double the rate set for sample inspections.
- (iii) Investigatory inspections can be triggered by a member of the public informing the Service Provider to bring their attention to a potential hazard. Again, these fees are not set by regulation although HAUC recommends that the fee should be the same rate set for sample inspections

The types and requirements for each type of inspection are contained in Annex 6.7.1.

6.7.2.3 Works

Turning to works, the street authority has power to carry out such investigatory works as appear to them to be necessary to ascertain whether an Undertaker has complied with his duties with respect to works and reinstatement. If a defect is disclosed, the street authority is entitled to recover their reasonable relevant costs and carry out three defect inspections at the Undertaker's expense.

6.7.3 Charging

Service Providers must be charging an Undertaker, where it is cost effective to do so. The cut-off level of cost effectiveness needs to be agreed between the Service Manager and the Service Provider. Similarly, where no charges have previously been made, the cut-off date before which no charges will be raised must be agreed between the Service Provider and the Service Manager in the light of local conditions.

Invoices for these charges must be issued by the Service Provider on Highways Agency invoices which are available in pads of 25 four part sets from Highways Agency Area Performance Teams. (Area Performance Teams should obtain them from FS Accounts Receivable at Hemel Hempstead. GTN 3827 128).

Invoice sets, including codes for the entries, should be completed by the Service Provider. The details of these will be available from the Highways Agency Area Performance Teams. (If Area Performance Teams do not have these details already they will need to consult FS Accounts Receivable.)

Once completed the Service Provider should distribute the four copies of the invoice set as follows:

- Top Copy To the Statutory Undertaker supplier being charged
- 2nd Copy To FS Accounts Receivable, Hemel Hempstead
- 3rd Copy To Highways Agency Area Performance Team
- 4th Copy To Service Provider's own records

6.8 Motorway Passes

6.8.1 Introduction

Motorway Passes are issued for two purposes. They record that the Secretary of State has granted exemption from The Motorway Traffic (England & Wales) Regulations 1982 to persons in connection with “any inspection, survey, investigation or census”.

Motorway passes also record that the holder is a person engaged in duties for which a general exemption to the *Motorway Regulations* exists. Such duties include “the maintenance, repair, cleaning, clearance, alteration or improvement of any part of the motorway” and “the erection, laying, placing, maintenance, testing, alteration, repair or removal of any structure, works or apparatus, in, on, under or over any part of a motorway”.

Motorway passes state the name of the holder, their employer and detail the purpose of the pass together with mandatory instruction on safety requirements. To enhance network security all new passes issued by the Highways Agency include a digital passport style photograph of the holder.

All passes are currently issued for a maximum duration of one year and must be returned to the Highways Agency upon expiry or if no longer needed.

6.8.2 Motorway pass holders

Service Providers’ staff undertaking “any inspection, survey, investigation or census” on the motorway must hold a valid motorway pass.

Service Providers are encouraged to issue motorway passes to their staff and any sub-contractors, safety inducted suppliers etc engaged in those duties for which the general exemption applies, as detailed above, to demonstrate they have the authority to be on the motorway.

6.8.3 MAPP System

To better control and simplify the process for applying and issuing motorway passes the Highways Agency have developed an internet based system termed MAPP.

The Service Provider must make applications for motorway passes using the MAPP system.

The Service Provider must develop a process to ensure that applications for passes using the new system are only made for those persons with the appropriate competence for the duties to be undertaken.

The Service Provider must nominate a user(s) to be trained in the use of the MAPP system to the Highways Agency’s Regional Network Access and Resilience Team. They will be trained in the use of the system by staff from the Highways Agency’s BIS section.

Following training, MAPP users will be able to make immediate use of the system to apply for motorway passes for their staff, or others under their contractual direction.

Applications for passes will be processed by staff working in one of the Highways Agency’s Network Access and Resilience teams and will be despatched by post to the MAPP user for distribution to those named. Passes will be accompanied by a letter, part of which should be signed and returned to the addressee to confirm receipt.

MAPPA users can use the system to track the progress of applications. Although the system facilitates the prompt supply of passes, Service Providers should allow two weeks for supply following submission of applications.

The MAPPA system automatically generates e-mails to remind nominated user when passes are due to expire to allow consideration to be given to renewing them. Such reminders will only be for passes issued with the new system.

Any feedback on the use of the MAPPA system should be directed to the Highways Agency's Network Management Policy Team.

6.8.4 Motorway passes for third parties

Third parties may also be granted authority to exemption from the <i>Motorway Regulations</i> for "any inspection, survey, investigation or census". Service Providers must direct any enquiries for motorway passes from third parties to the Highways Agency's Regional Network Access and Resilience team.

Staff within the Highways Agency's Network Access and Resilience will arrange for third parties to be vetted to ensure that there is a genuine need for motorway passes to be issued. As part of this vetting process the third party will be appraised on the need to liaise with the Service Provider before the motorway is accessed.

In some circumstances where third parties require motorway passes to support the Highways Agency's objectives, e.g. design agents, the Highways Agency may grant access to the MAPPA system. Such access is only granted to those third parties that fulfil safety and procedural requirements. Enquiries from third parties seeking such access should be directed to the Highways Agency's Regional Network Access and Resilience team.

6.9 Optimising Traffic Management at Road works (The Use of Night-time Only Working)

6.9.1 Introduction

6.9.1.1 General

This chapter sets out a number of considerations which should be taken into account by Service Managers and Service Providers when planning traffic management for works on the Network. It draws upon experience gained by the Highways Agency on queues and delays at road works supplemented by extensive analysis of road user (QUADRO) and works costs. Various options are considered, but the emphasis is on the possible use of night-time only working. The Highways Agency is pursuing this initiative with the objective of a reduction in the disruption and delay caused by road works on trunk roads. Working in hours of darkness is dealt with in Section O3.9 of TSM Chapter 8 (Operations).

Criteria for the planning of traffic management are set out below, and they provide a decision making tool for the adoption of night-time working. Guidance is also given concerning issues that should be considered at the planning stage. Planning the works is dealt with in Section D2 in TSM Chapter 8 (Design). The range of works for which this chapter is appropriate is given in 6.9.4 below.

6.9.1.2 Definitions

In the context of road works on the Network, the following terms are used:-

- a). **"Night-time only working"** (NTO) describes activities which commence after the evening peak traffic flow has subsided and are completed prior to the build-up of the morning peak traffic flow on the following day. In such circumstances, lane closures reduce the traffic carrying capacity of a road during the night, but all lanes are available for traffic use during the day.
- b). **"24 hour working"** describes road works where the conventional daytime working is extended into a 24 hour operation by the use of shift working. The essential difference between 24 hour working and night-time only working is that during 24 hour working there is no specific requirement for the full carriageway to be restored to live traffic at the beginning of each day. Although this chapter is directed towards night-time only working, many of the issues contained within it also apply to 24 hour working.

6.9.2 Considerations

6.9.2.1 General

Safety must be the primary consideration at all road works, and during both works planning, and execution, the Service Manager and Service Provider must address the safety needs of those engaged in the road works, the road user, and the general public.

6.9.2.2 Health and Safety

Compliance with all the relevant requirements of the Health and Safety at Work Etc Act, 1974, and the regulations made under it, is necessary to safeguard those working on the highway.

The Management of Health and Safety at Work Regulations 1999 (MHSWR), requires all employers to assess the risk to workers and any others, who may be affected by their undertakings. All employers who impose duties on their employees which means that they are

required to visit or work at roadwork sites, must have carried out a suitable and sufficient risk assessment commensurate with the requirements of the MHSWR.

Further information on health and safety legislation and risk assessment is given in Part 1.

In the exercise of risk assessment, as explicitly required in MHSWR, night-time working must give rise to separate risk assessments from those produced for daytime working. In these risk assessments additional factors pertaining to night-time only working, such as fatigue, night vision and night-time temperatures must be taken into account.

Information about procedures for making risk assessments can be found in the Health and Safety Executive publications "Five steps to risk assessment" and "Successful Health and Safety Management".

Night-time work on electrical and electronic equipment systems often requires a considerably higher quality of illumination than that required for other activities. This arises from the need to identify small features and to distinguish between colours.

6.9.2.3 Road Safety

The safety of road users and the workforce must be addressed in the preparation of contract documents which must specify adherence to Chapter 8 of the Traffic Signs Manual in conjunction with the HA/CSS/HSE document "Guidance for Safer Temporary Traffic Management" of which Section 7 specifically deals with Night-time Working.

Special consideration of salting requirements and scheme specific temporary signing may be necessary.

6.9.2.4 Technical Matters

When planning night-time only operations, it is essential that the road is reopened to traffic before the following morning peak period or as stipulated in the contract or as agreed with the Service Manager.

This objective can be achieved with more certainty if the time specified for the full removal of traffic management includes a "buffer" period, particularly on traffic sensitive routes. For example, if traffic flows are such that the road is to be fully reopened by 06:00, then it could be specified that the traffic management should be fully removed by 05:30.

The past performance of individual organisations, the installed traffic management layout and/or the proposed works are factors that should be considered in determining the amount of buffer period to specify. It is recommended the buffer period be between one half to one hour. This should enable a significant amount of work to be undertaken each night without excessive risk of late removal. Additionally, an assessment should be made as works progress with consideration being given to the early stopping or abandonment of work if it becomes apparent that timely removal will not be achieved.

Planning of the night-time programme should allow for factors such as lower temperatures and higher humidity, which can affect materials behaviour. At the planning stage of maintenance project, if night-time only working is being considered materials and construction techniques should be appraised with reference to their technical characteristics and suitability for night-time working. For example, it may be necessary to specify polymer modified cements rather than ordinary Portland cement where mortars will be subject to traffic loading within hours of being placed, or to adjust the specification to incorporate additives to lower the freezing point for water based operations such as drain jetting on cold winter nights.

Some maintenance activities, particularly those requiring high levels of skill and involving fine visual judgement can, if poorly controlled, result in lower quality workmanship during night-time only working. Each aspect of work should be assessed at the planning stage to establish that the quality of work produced by a competent contractor can meet the specification under night-time only working conditions. Such assessments can be achieved by reference to previous experience. Consultations with other Service Providers may be necessary. During construction, the daily re-introduction of traffic to the working area imposes access restrictions for quality monitoring. However, notwithstanding these constraints, arrangements should be made for the systematic monitoring of quality, to ensure that specified standards are maintained.

6.9.2.5 Availability of Materials

At the planning stage of a maintenance project for which night-time working is being considered, the availability of materials should be guaranteed. In particular, it is necessary to ensure that within the locality of the road works, where such materials are required, there will be a certain and timely supply of materials such as asphalt and concrete when required. The Service Provider should check that local mixing plants are not affected by planning/environmental restraints before tenders are invited so that contractors are able to meet the requirements of the contract.

6.9.2.6 Environment

Night-time working can be highly disruptive for local residents and others affected by the works themselves, and the activities needed to service them. At the planning stage, levels of noise, light, and vibration acceptable to the appropriate Local Authority Environmental Health Department should be agreed. The Service Provider must include these in the contract documents, after checks have confirmed that they can be achieved by competent contractors. During night-time hours, the public perception of these factors is often considerably more acute than in daytime.

6.9.2.7 Publicity

Publicity must be planned well in advance by the Service Provider and should be consistent and not be the result of crisis management. Well directed publicity prior to the commencement of works can be beneficial. In particular, MPs and local councillors should always be included in advance publicity. Local residents often display greater tolerance of noise and disruption of which they have prior knowledge concerning its timing and duration.

Experience indicates that the distribution of leaflets to all affected residents and other helpful information should always be considered. For more intrusive works, personal visits to affected homes can produce higher levels of acceptance and co-operation; such courteous advice to members of the public should always be considered and normally provided.

6.9.3 Decision Making

6.9.3.1 General

A major objective in the planning of road works is the reduction of overall traffic delays. However, the works cost associated with minimising traffic delays by using night-time only working does carry a premium compared to works costs incurred for the same work undertaken in daytime. However growing experience in night-time only working has reduced this premium. For the analysis in Annex 6.9.1, 6.9.2 and 6.9.3, night-time only working was assumed to attract a premium of between 10% and 25%. The duration of a scheme was assumed to double when night-time only working was employed, based on an 8 hour working period under night-time only working compared with a 16 hour working period for a day closure.

At lower traffic flows the difference in scheme cost between the various traffic management options is often small but once night-time only working becomes valid then the difference to the next best option can become very significant. This section provides guidance for the evaluation of the additional works costs associated with night-time working against the benefits arising from the reduction in delays to road users. However, it should be noted that there are often occasions where night-time only working is the only traffic management option open for a scheme.

6.9.3.2 Capital Schemes

All schemes, for which night-time only working is a safe and technically practicable option, must be assessed to establish the optimum traffic management arrangements under which the works are to proceed. To do this, it will be necessary to calculate the total cost of the scheme under the alternative traffic management arrangements, including night-time only working. The total cost must comprise the works cost, plus the cost of the traffic management measures, plus the cost of delays, and incidents and accidents generated by the presence of the works, estimated by dedicated QUADRO runs.

Where night-time only working is unsuitable for technical reasons but QUADRO costs are high, consideration should be given to the extension of the working day as far as is practicable, to allow the works to be completed as quickly as possible. Subject to safety, technical and environmental factors and contractual conditions, the working day can be extended to 24 hours, although optimum progress is often achieved with an 18 hour day.

6.9.3.3 Optimising Major Maintenance

Annexes 6.9.1, 6.9.2 and 6.9.3 contain examples of detailed analyses of three typical maintenance schemes, a dual four lane carriageway, a dual three lane carriageway and a dual two lane carriageway. In each case the estimates total cost of the scheme is plotted against Average Annual Daily Traffic (AADT) flows, for various traffic management arrangements, including night-time only working. The analysis for optimisation covered schemes of varying cost and duration and took into account the relative costs of traffic management expressed as a proportion of the main works cost (defined simply as high, medium or low). The analysis reveals that general recommendations on valid traffic flow ranges could be given for each option. However, at one extreme or another of any given range, a particular option may not always be the optimum choice and this is indicated in Annexes 6.9.1, 6.9.2 and 6.9.3 within the text and graphs.

The recommendations for each option are valid over a range of daily traffic flows. Where there are two or more recommendations for a given flow rate, each needs to be considered on its own merit. If the traffic flow figure lies outside the recommended range for a given option, it does not necessarily mean that particular option cannot be used. However, if this is the case it is probably unsuitable.

6.9.3.4 Routine Maintenance

Routine maintenance activities should be combined and undertaken within a single lane closure or mobile lane closure wherever possible, and considered for night-time only working. Planned or routine tasks can often be undertaken to take advantage of traffic management provided for other parallel activities. The Highways Agency's maintenance contracts for its traffic management systems (HATMS) contain mechanisms to facilitate short notice requests for night-time repair.

It is strongly recommended that routine maintenance operations should also be assessed to establish the optimum traffic management arrangement under which the works are to proceed. The total assessed cost of the operation under each traffic management arrangement will comprise the works cost plus the cost of delays and incidents etc as estimated by QUADRO.

6.9.4 Carrying out Works

6.9.4.1 Current Practices

Night-time only working has been adopted as a suitable working method on heavily trafficked roads for the following activities:

- a) Carriageway resurfacing and patching;
- b) Surface dressing;
- c) Joint sealing;
- d) Safety fence maintenance and repairs;
- e) Gully cleaning and sweeping;
- f) Weed spraying;
- g) Road signs and lighting maintenance;
- h) Carriageway markings;
- i) Reflective stud maintenance;
- j) Deflectograph surveys;
- k) Falling Weight Deflectometer (FWD) surveys;
- l) Visual surveys (HAPMS Surveys);
- m) Inspection and maintenance of structures;
- n) Installation of electronic road loops.

This list of activities is not definitive, and with the advance in the capabilities of plant and materials, and the use of new techniques, it is anticipated that further maintenance activities will become suitable for night-time only working in future.

6.9.4.2 Summary

Night-time only working **should be considered**, wherever it is a safe, technically and environmentally practicable option, for maintenance works on:-

- (a) D2L Carriageway - traffic flows > 45,000 AADT
- (b) D3L Carriageway - traffic flows > 80,000 AADT
- (c) D4L Carriageway – traffic flows >110,000 AADT

Annex 6.1.1 Network Occupancy Management Plan Template**Introduction & Purpose**

The purpose of the Network Occupancy Management Plan is to set out the approach to managing the area or route network.

This document is a template against which individual service providers can base their own individual network occupancy management plans. Instructions, guidance and examples are shown in red text – this text should be removed, completed, replaced or amended as appropriate.

1.1 Area / Route Details

Area / Route	<i>Area number or route name</i>
HA Area Team NOM Contact	<i>Name and contact number</i>
Service Provider NOM Contact	<i>Name and contact number</i>
NAR Team Network Access Manager	<i>Name and contact number</i>

1.2 Implementation & Departures

Describe in this section any elements of the Network Occupancy Management Process that are not being applied, for example, where the requirement to enter activity information onto the SRW system in 'near real time' outside of normal office hours. Any agreed departures from any other relevant standards or procedures, such as the requirements of AMM58/05, should also be detailed in this section. Where full implementation is applicable this should be clearly stated.

1.3 Performance Targets & Priorities

Provide details in this section of specific area and route performance targets and details of any route priorities, particularly in respect of the PSA target. PSA and non-PSA routes should be clearly identified.

Details of Area or Route Performance Targets (Section 6.2)		
Route	Performance Target	Comments

Details of Area or Route Priorities (Section 6.3)		
Route	Location/Sections	Details

1.4 Coordination Arrangements - Contact Details

Relevant Third Party Term Contracts	
Contract	Contact (Name and Number)
NTCC (TiS)	<i>Name and contact number</i>
NRTS	<i>Name and contact number</i>
TechMAC Provider	<i>Name and contact number</i>

Adjacent Areas & DBFO Routes	
Area / Route	Contact (Name and Number)
	<i>Name and contact number</i>

Adjacent Local Highway Authorities	
Authority	Contact (Name and Number)
	<i>Name and contact number</i>

1.5 Coordination Arrangements - Formal Coordination/Scrutiny Arrangements

Provide details in this section of the arrangements for coordination and forward planning, specifically details of the regime to be adopted to meet the requirements of section 6 and 7 of the Network Occupancy Management Process. Where existing meeting and liaison arrangements are being utilized these should be made apparent.

Details of Coordination / Scrutiny Meetings (Sections 6.10 and 7.7)		
Frequency	Location	Scope
<i>monthly</i>		
<i>quarterly</i>		

1.6 Coordination Arrangements - Detailed Area / Route Specific Arrangements

Provide details in this section of the specific coordination issues relevant to this particular area or route.

Details of Alternative Route Conflicts (Section 6.4)	
Route/Sections	Route/Sections

Details of Local Authority Coordination Meetings (Section 6.8)			
Authority	Location	Frequency	Attendance

Annex 6.1.2 Activity Booking Information

The following core information is requested for all activity booking on the network

SRW Reference No	
Status	
Road No	
Start date	
End date	
Description	
Notes/Comments	
Location Textual	
Expected delay	
Closure type	
Project Manager's name	
Project Manager's telephone	
Contractor's name	
Contractor's telephone	
Activity type	
Reference number	
Traffic Management	
TM Start grid reference (12 fig)	
TM End grid reference (12 fig)	
Activity Promoter	
Nature of works	
Narrow lanes	
Temporary speed limits	
To be published	
Summary Closure Records Only	
Hardshoulder only	
Closed Lanes	
Added Lanes	
All Closure Records	
Component data (i.e. mapping data on which sections of road are affected)	
Detailed Closure Records Only	
TM Layout data	
Detailed Diary data	

Annex 6.1.3 Management of Nationally Significant Activities**6.1.3.1 Introduction & Purpose**

This annex to the Network Occupancy Management process chapter sets out the definition of Nationally Significant Activities, provides an overview of the suggested management arrangements and sets out a simple checklist of considerations to be made when planning and preparing for such activities.

6.1.3.2 Definition of Nationally Significant Activity

A Nationally Significant Activity is an activity that is likely to cause significant disruption across the network extending beyond an individual area or route. Nationally Significant Activities are those that require particular planning at a regional and national level which goes beyond the 'regional coordination' undertaken by Service Providers.

An event of national significance would not necessarily need to be considered as a Nationally Significant Activity unless it had an impact on the network extending beyond a particular area and its immediate neighbouring areas.

Nationally Significant Activities could be works activities or off-network events. An example of a works activity that might be considered a Nationally Significant Activity would be the closure of a motorway for demolition of a structure. An example of an off-network event that might be considered a Nationally Significant Activity would be the 2012 Olympics.

Nationally Significant Activities will typically require extensive long term planning and involve a wide range of stakeholders.

6.1.3.3 Management of Nationally Significant Activities

The Regional Network Access & Resilience Teams' Network Access Managers are responsible for taking an oversight on all Nationally Significant Activities on behalf of the Network Performance Managers.

It is not possible, or appropriate, to prescribe the way Nationally Significant Activities should be managed as the arrangements will depend on the particular details of the planned activity. Clearly the Highways Agency's role will depend on whether the activity is its direct responsibility, such as a road scheme, or one where then Highways Agency is simply one of a number of stakeholders, such as an off-network event.

A simple checklist has been provided as a guide, however specific plans should be developed for all Nationally Significant Activities. It is suggested that a risk based approach be taken to planning and an 'issues and mitigation' register should be developed for each Nationally Significant Activity.

6.1.3.4 Activity Details

Activity	<i>Title</i>
Description	<i>Description</i>
Location	<i>Detailed location (route, region, authority)</i>
Promoter	<i>Name and contact number</i>
Date	<i>Planned start and end dates</i>
Network Access Manager	<i>Name and contact number</i>
Area / Route	<i>Area number or route name</i>
Service Provider Contact	<i>Name and contact number</i>

6.1.3.5 Action Checklist

Action Checklist	Yes/No	Date
Event Plan: received		
Event Plan comments: returned		
Safety Advisory Group meeting attended		
Police and Emergency Services contacted		
Service Providers contacted		
SRW – Programmed Works checked		
National Authorities contacted (Scotland and Wales)		
LHA contacted		
NTCC contacted		
RCC contacted		
Freight Transport Association contacted		
Media/Publicity prepared/notified		
HA Regional Contacts		

6.1.3.6 Issues and Mitigation

Issue	Mitigation

Annex 6.1.4 Network Occupancy Management and the PSA Reliability Target

6.1.4.1 Introduction

This annex provides supplementary guidance and direction on the policy detailed in the Network Occupancy Management (NOM) process, issued under AMM83/07 and included in this document at Part 6.1. It sets out the Highways Agency's policy on specific measures to be implemented in respect of the PSA Journey Time Reliability Target.

6.1.4.2 Working Time Restrictions

Lane closures on PSA routes between 0600hrs and 2000hrs are not normally permitted and any such closures that are needed will require specific written approval. Where the activity is 'significant', approval from the Regional Operations Board (ROB) will be required and, for all other activities, approval will be required from the Network Performance Manager (NPM).

Significant activities are those activities where the traffic management arrangements are likely to impact on the PSA measure. This would typically include longer term activities or activities such as major renewals and the larger area improvement schemes.

6.1.4.3 Temporary Speed Limits

The guidance contained in the recently updated version of Chapter 8 of the Traffic Signs Manual must be followed. Specifically, the recommended reductions in speed limits must be adopted by the Service provider which, in effect will mean that, on dual carriageway roads where the national speed limit applies, a temporary restriction of 50mph will be used. Reductions in excess of the recommended 20mph are not permitted without specific approval. In the case of significant activities approval will be required from ROB and, for all other activities, from the NPM. There may be circumstances where activity promoters identify specific hazards where an appropriate risk mitigation may be to introduce a temporary speed limit reduction of greater than 20mph - before taking this course of action all avenues of mitigating the identified risk in other ways must be explored by the Service Provider. In seeking approval for a departure it will be necessary to demonstrate that alternative risk mitigation actions have been considered.

Average speed check cameras should be implemented to enforce temporary speed limits for all significant activities.

Where TASCAR systems for roadworks are to be used, IAN 113/08 sets out amendments for the current notes in the Manual of Contract Documents for Highways Works (MCDHW).

6.1.4.4 Approval Process

The Service Provider must complete the Departure Approval Form, attached within Annex 6.1.5, in all cases where approval, as detailed above, is required. The completed form must be submitted to the Service Manager for checking.

For significant activities requiring approval from ROB the Service Manager will e-mail the checked and signed form to the RPP e-mail inbox with a covering submission expanding on the basic details included on the form. The submission will be considered for a decision by the Divisional Director in his capacity as Chair of ROB and, if he feels it necessary, it should be tabled at the next ROB meeting for a decision.

For all other activities, those requiring approval from the NPM, the checked and signed form will be submitted by the Service Manager to the NPM for approval.

The commencement of the activity is not permitted until such time as approval has been granted.

Details of the proposed activity must however be entered onto SRW as a 'provisional' booking, by the Service Provider responsible for the Network on which the activity is planned, in the timescales set out in the NOM process.

The approval process will be subject to audit by the regional Network Access Resilience Teams and therefore records of approvals must be recorded and readily available for inspection.

6.1.4.5 Additional Requirements

Breakdown Recovery and CCTV are to be standard provision on schemes over £4M value or more than 6 months duration. Exceptions to this must be detailed by the Service Provider in the submission to ROB and will require specific approval.

Monthly review and amendment of scheme temporary traffic management signage must be undertaken to minimise traffic delays. All schemes must have clear signage at the start and finish outlining what is being done and the completion date. These reviews will be considered at the monthly area network occupancy meetings.

Annex 6.1.5 – Network Occupancy Management – Departure Approval Form

This form is to be used where a departure from the requirements set out in Annex 6.1.5 is required and should be used specifically where traffic management is being applied on PSA routes during PSA hours. This form should also be used where traffic management is required on non PSA routes where there may be an impact on PSA routes.

SRW Closure No.			
Does the departure relate to		Select from list	
Area Team		Select from list	
Project/Scheme <i>Brief description (to include Type of Work and what category in line with SRW)</i>			
Location <i>Brief details of location (to include junctions roundabouts and slip roads)</i>			
Direction		Northbound Eastbound	Southbound Westbound
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
Duration <i>Estimated duration of works</i>			
Road Standard		Carriageway Select from list	Number of lanes Select from list
		Current PSA Variance	
		Current Link Rank	
		Two Way AADT	
		Maximum Hour Flow	
Traffic Management Arrangements <i>Brief description of proposed lane closures and restrictions, duration and scheme length</i>			
Has alternative traffic management been considered		Select from list If yes, what	
Reason for Departure <i>Brief scheme details, include explanation of why restrictions required</i>			
Main reason for not planning work outside PSA hours Explanation		Select from list	
Effect on traffic		Select from list	
Is this route a PSA measured route		Select from list	
If no, do the works impact on a PSA measured route If yes, which route Impact on PSA JTR measure		Select from list	
Approval			
Submitted by (Service Provider)		Signature	Name
			Date
Checked by (HA Area Team)		Signature	Name

Network Occupancy Management – Departure Approval Form

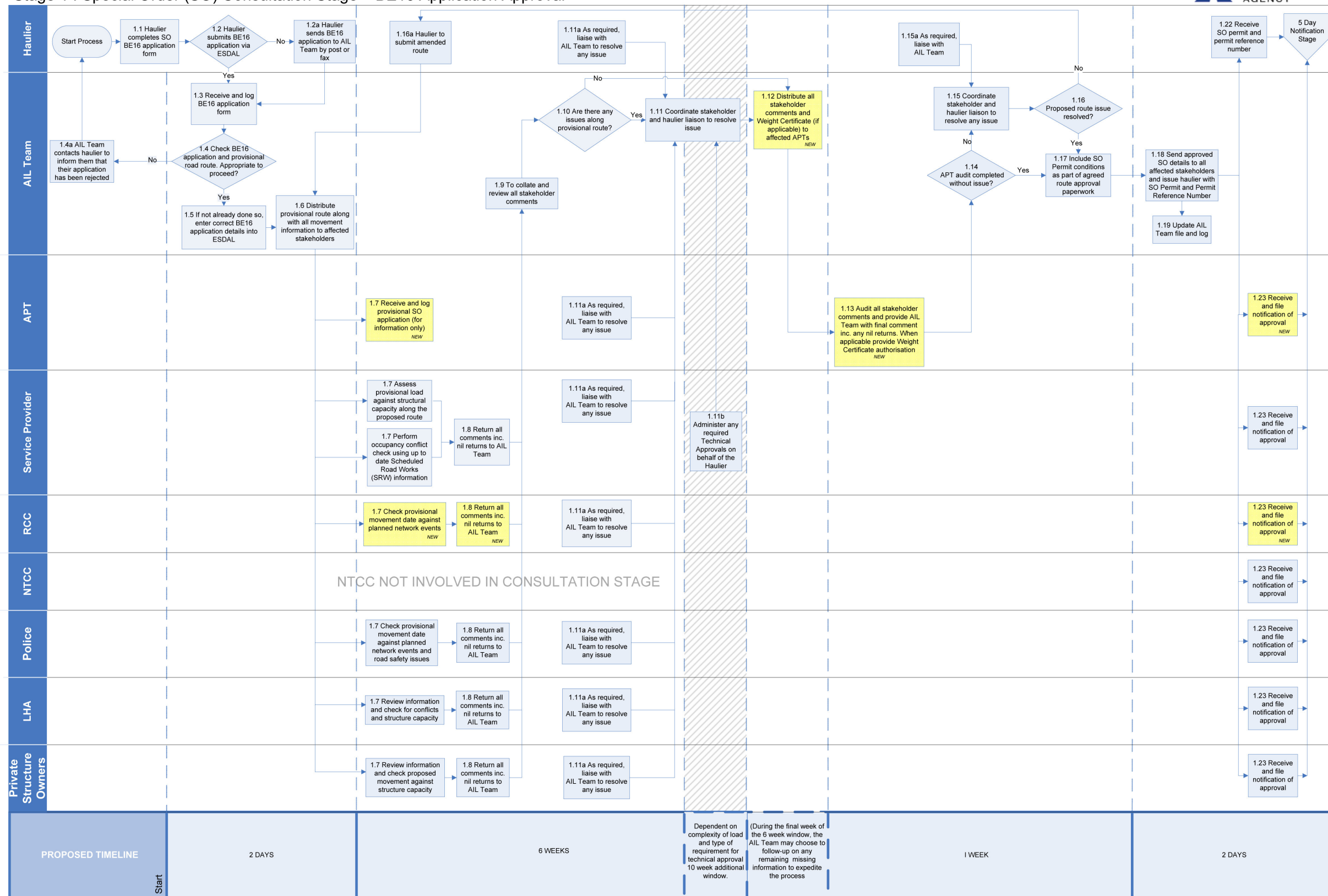
		Date
Approved (Network Performance Manager)	Signature	Name Date
ROB Approval	Signature	Name Date

Annex 6.3.1 – Code of Practice for the erection of temporary traffic signs to special events

1. Temporary signs should be provided only for events expected to attract a considerable volume of traffic from outside the local area and where there is adequate car parking for vehicles directed to the event. They should not be used on routes where there are already permanent local direction or tourist signs to the site although for some major events it may be desirable to indicate other routes to assist traffic management. Signs should not normally be erected more than 48 hours before an event or retained more than 48 hours after it has ended.
2. The signs must comply with the provisions of the Traffic Signs Regulations and General Directions (currently set out in regulation 53 of the 2002 Regulations) and must give clear information about the route to be followed in a size appropriate to the speed of traffic.
3. The badge of the road user organisation erecting the sign may be included. Commercial names of event sponsors should not be included unless similar events in the same areas at the same time make such identification necessary for traffic management purposes. Dates and times should not normally be included since the signs are not intended to advertise an event but are for people who know about it and need guidance to the site. Such information may however be included if the traffic authority considers it would be helpful to other road users to have advance information about likely congestion and is satisfied that it would not make signs too complicated to be easily legible and so endanger road safety.
4. The design, construction, mounting and siting of signs should be in accordance with the advice given in TSM Chapter 8 Sections D4 (Design) and O4 (Operations). The signs should be built to sound engineering principles and be of robust construction but the materials used need not be as durable as those used for permanent or portable signs. The fixings used must not damage the posts to which signs are fixed.
5. Signing proposals should be put to the appropriate traffic authority in time for them to be given proper consideration and for the police to be consulted where necessary. This should normally be at least 4 weeks before the event. Proposals should include information about the nature of the event, the expected number of visitors and the provisions for car parking. The distance from which signs should be provided and the number of routes to be indicated depends on the nature of the event and the volume of traffic anticipated but once signing has commenced adequate continuity should be provided along the route. Signing for up to 5 miles or from the nearest A or B road should usually be adequate. More extensive signing may be appropriate for events which are expected to attract very large numbers of visitors (e.g. major air shows) but it is very rarely appropriate for signs to temporary events to be erected on motorways. The traffic authority is the final arbiter of the signing appropriate for any event and may remove or re-site any signs which have not been approved at the cost of the body which erected them.
6. Organisations erecting temporary traffic signs on the highway must take all necessary measures to avoid danger to the public or obstruction of traffic during the operation as specified in TSM Chapter 8 and the booklet "Safety at Street Works and Roads Works a Code of Practice". These organisations are responsible for the cost of making good any damage to street furniture and Statutory Undertakers' equipment resulting from the erection of the signs and must have adequate public liability insurance cover. They will be required to indemnify the traffic authority against any claim arising out of an accident alleged to have been caused by the inadequacy of a temporary sign whether in siting, visibility, insecure mounting or other cause.

Annex 6.5.1 – Abnormal Indivisible Load Special Order Process - Stage 1

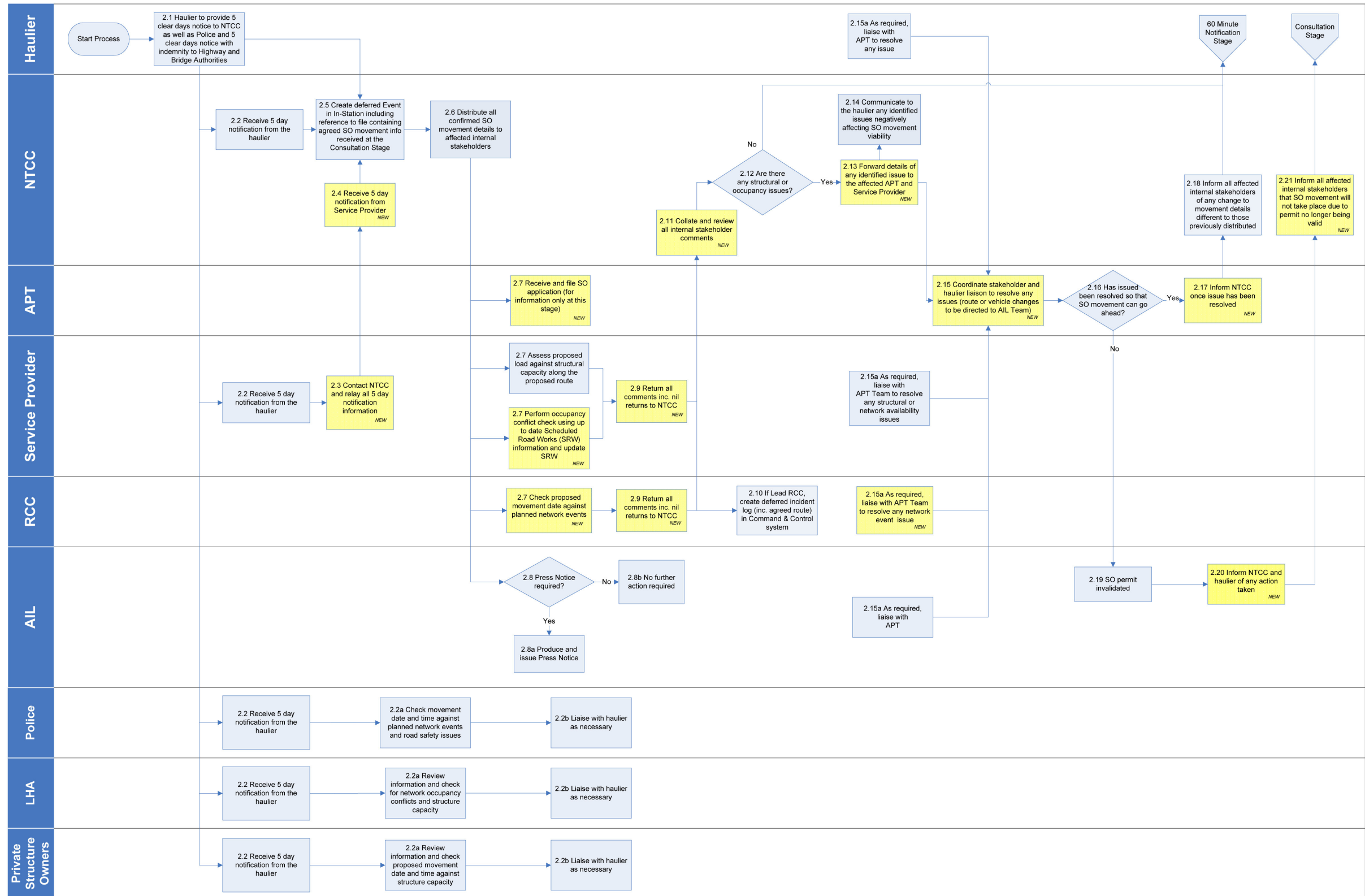
Stage 1 : Special Order (SO) Consultation Stage – BE16 Application Approval



Final version Sept '08

Annex 6.5.2 – Abnormal Indivisible Load Special Order Process - Stage 2

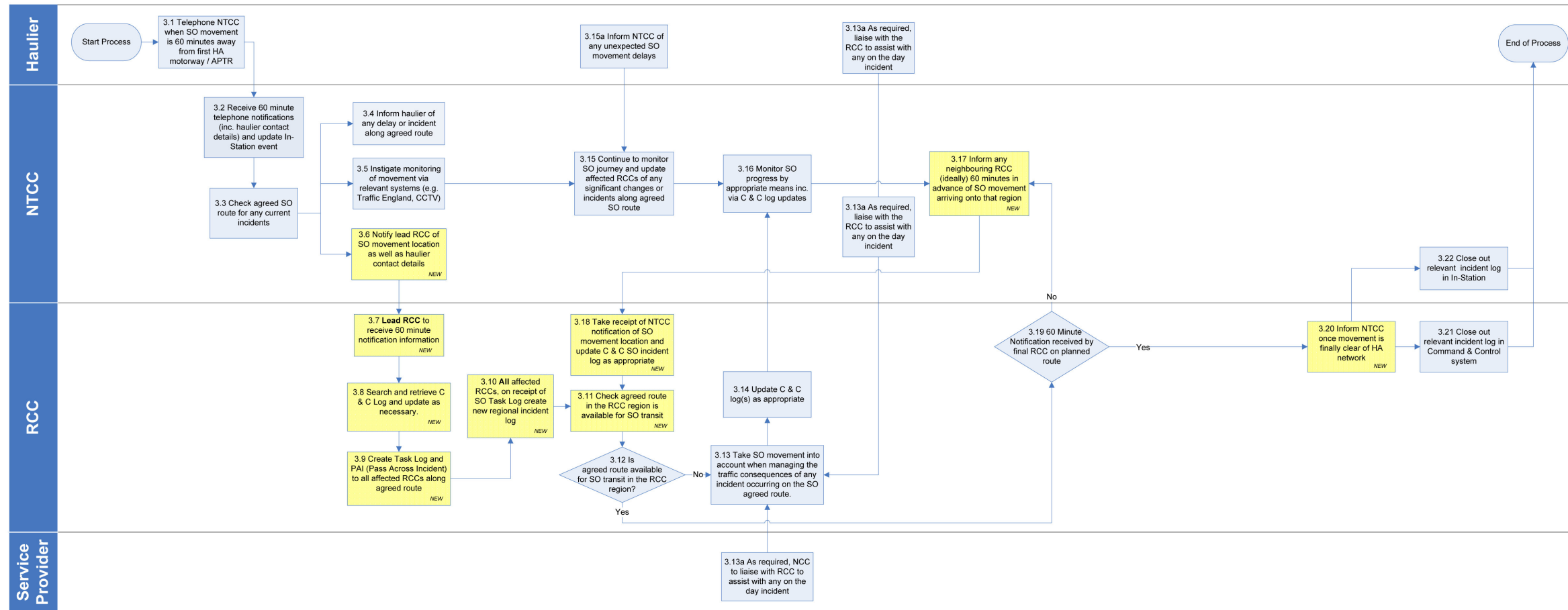
Stage 2: 5 Day Notification Stage



Final version Sept '08

Annex 6.5.3 – Abnormal Indivisible Load Special Order Process - Stage 3

Stage 3 : Special Order (SO) 60 Minute Notification Stage



Final version Sept '08

Annex 6.6.1 Preliminary Condition Report

- 1 The Preliminary Condition report produced by the Service Provider will provide the consultant/designer with an overview of the maintenance needs of that section of motorway or trunk road covered by his commission. The report must be sufficiently comprehensive to convey the Service Provider's understanding of the condition of the motorway or trunk road. It should include the following:-
 - a) Date opened to traffic;
 - b) Original pavement construction;
 - c) Maintenance history of carriageway;
 - d) Plan of each carriageway showing the residual life in 100 metre lengths and survey date;
 - e) Plan showing major surface defects on each carriageway;
 - f) An indication of any slope stability problems;
 - g) An indication of the condition of the drainage;
 - h) An indication of the condition of any lighting, CCTV or communications and installation.
- 2 For each structure, the following information should be provided:-
 - a) The maintenance history including the results of any assessment and an outline of any upgrading or strengthening work undertaken;
 - b) An indication of any problems due to ASR, carbonation, chloride attack, etc.
- 3 The Service Provider should comment on the need for and timing of any future maintenance and indicate what work, if any, has been included in the 5 year rolling programme.
- 4 The following detailed information is likely to be required by the consultant/designer and this should be provided separately by the Service Provider when requested:-
 - a) Deflectograph output from DEFLEC;
 - b) CHART output;
 - c) Records of pavement construction;
 - d) Results of trial holes/cores;
 - e) Results of CCTV drainage reports;
 - f) Principal bridge inspection reports;
 - g) General/special bridge inspection reports;
 - h) Results of bridge assessments;
 - i) Bridge Forms 277;
 - j) Records of the type and extent of any existing lighting, CCTV or communications installation.

Annex 6.6.2 Temporary Withdrawal of Responsibilities**Model Letter to Service Provider**

- 1 In accordance with Clause 6 of the Agreement for the Maintenance of Trunk Roads and Motorways dated [], I am seeking your consent to the temporary withdrawal of responsibilities from your Authority for the maintenance work specified in the attached schedule.
- 2 You will be aware that [] have been working on behalf of the Highways Agency on the proposed TPI Scheme [] between [] and []. To minimise disruption to the travelling public, we propose to incorporate any necessary maintenance works to the carriageway and the structures in the contract and to transfer responsibility for the design and supervision of these maintenance works to [].
- 3 You will retain responsibility for routine maintenance of the Network up to the start of the widening contract. This will include responsibility for inspections of the carriageways, carried out in accordance with the Network Management Manual and the Routine & Winter Service Code, and inspections of structures, carried out in accordance with DMRB Vol. 3 Section 1. For the duration of the contract, the Contractor will be responsible for routine maintenance of that part of the Network within his site. On completion of the contract, you will be asked to resume normal Service Provider delegated responsibility for this section of the Network and a further letter will be sent to you at that time. There will be no transfer of responsibility to [] or the Contractor in respect of winter (or electrical) maintenance.

SCHEDULE

The schedule should set out clearly the maintenance responsibilities to be transferred to the consultant/designer, define the length of Network involved and the duration of the transfer with start and finish dates.

Annex 6.7.1 Inspection of Statutory Undertaker's Works**Introduction**

- 1 It is accepted that reinstatements, even when undertaken to the required standard, have a long-term detrimental effect on the structure of the highway. This effect is significantly increased where the reinstatement is *not* undertaken to the correct standard. Deficiencies in reinstatements, and in signing and guarding, can present a danger to road users.
- 2 The importance of the inspection regime implemented by Service Providers cannot be understated. Although responsibility for reinstatement lies with the Undertaker, liability resulting from deficiencies can fall to the street authority where appropriate actions have not been taken following identification of a defect. This liability may also extend to situations where deficiencies in street works are not identified during the street authority's routine activities on the street.
- 3 It is the responsibility of all Service Providers to implement appropriate measures to ensure the safety of road users and protect the Highways Agency from any potential liability resulting from deficiencies on the Network. A regime for undertaking inspections, and robust procedures for dealing with deficiencies identified must satisfy both of these requirements.

Relevant Documentation	
NRSWA	Section 65 and Sections 70 to 73 and 75
Regulations	<i>The Street Works (Reinstatement) Regulations 1992 (and amendments)</i> <i>The Street Works (Inspection Fees) (England) Regulations 2002</i>
Codes of Practice	<i>Code of Practice for Inspections</i> <i>Specification for the Reinstatement of Openings in Highways</i> <i>Safety at Street Works and Road works - A Code of Practice</i>

1 General Arrangements

- 1.1 The Act places a clear responsibility on the Undertaker executing the work to meet the statutory standards specified for both reinstatement of those works and the signing and guarding of the works while they are in progress. Undertakers are expected to supervise and inspect their own works, identify deficiencies, and instigate corrective action as required. The street authority's role is not one of supervisor but powers are available under the Act to take certain actions when deficiencies are identified.
 - 'Deficiencies' are either a failure to meet the standard defined within the Specification for the Reinstatement of Highways (known as a 'defect') or the failure to meet the signing and guarding requirements specified within the Safety at Street Works Code of Practice (known as an 'inadequacy').
- 1.4 It is clear from evidence gathered by many local highway authorities that a significant amount of work executed by Undertakers fails to meet the required standards in respect of both reinstatement and signing and guarding.

- 1.3 The consequences of deficiencies in reinstatement and signing and guarding of street works will be greater on motorways and trunk roads due to the higher volumes of traffic carried on this Network. The Highways Agency therefore expects that a full 30% of each Statutory Undertaker's works to be inspected and any subsequent defect and improvement notice procedure vigorously pursued, to ensure that the impact of street works is kept to a minimum. The relatively low levels of street works activity on motorways and trunk roads, coupled with the high level of routine inspection undertaken on the Network, means that a more rigorous, pro-active inspection regime can be easily implemented by Service Providers.

- 1.4 It should also be noted that Undertakers are expected to regularly inspect all their own works, to identify any deficiencies and initiate corrective measures as required. Where defects are identified they must notify the street authority and provide a timetable for carrying out remedial works. The defect regime does not apply and the charges for additional inspections cannot be levied unless the Undertaker fails to carry out the work within the specified timescale.

2. Sample Inspections

- 2.1 Sample inspections are carried out on a specific number of inspection units as agreed with the Undertaker on a random basis at 3 specific stages in the Undertaker's works as defined in the Code of Practice and as shown below. Any defects or inadequacy found as a result of these inspections should be notified to the Undertaker immediately. The results of all sample inspections should be reported to each Undertaker, quarterly in arrears.

Cat A	During the works
Cat B	Within the six months following interim or permanent reinstatement
Cat C	Within the three months preceding the end of the guarantee period.

- 2.2 To enable large and small works to be inspected at the same rate, sample inspections are based on inspection units. One inspection unit is 200m or part of 200m of trench or a number of none trench excavations within 500m, as laid down in the code of practice.

- 2.3 The main purpose of the sample inspection regime is to provide a performance measure on the Undertakers' works. If more than 10% of the sample inspections in a 3-month period reveal a defect or inadequacy an improvement notice should be issued (if the Undertaker carries out 50 or less inspection units in a year this is at the discretion of the street authority). Separate improvement notices must be issued for defects or inadequacies. Where an improvement notice has been issued the Undertaker concerned must develop an action plan to satisfy the street authority that the necessary actions are being taken to rectify the problem.

- 2.4 Significant failures in an Undertaker's works resulting in the need to issue an improvement notice should be reported to the Highways Agency's Regional HAUC (Highways and Joint Utilities Committee) Representative so that the issue can be made known to other HAUC members. The results of all sample inspections should be reported to Regional HAUC representatives on a quarterly basis, to enable Undertaker performance to be compared with other highway authorities in that Regional HAUC.

- 2.5 Defective reinstatements have a detrimental effect on the surrounding structure and fabric of the highway and the long-term resultant repair costs, although perhaps not directly attributable to street works, are significant. Service Providers should ensure a pro-active regime of street works inspections is implemented. The Code of Practice allows for

inspection fees to be charged against a sample of 10% of works at each phase, additional works may be inspected but a fee is not recoverable.

3 Routine Inspections

- 3.1 These are inspections of the Network for the Highways Agency's own purposes such as Safety Patrols, Safety Inspections or Detailed Inspections. These routine inspections should be actively used to inspect any Undertaker's works in the vicinity. Procedures should be in place to notify the Undertaker of any defects or inadequacy found during these inspections and take any follow up action as may be necessary.

4 Investigatory Inspections

- 4.1 When a report is received from a third party, for example the police or a member of the public, a site visit may be undertaken to confirm the defect. Any defects or inadequacies found as a result of these inspections should be notified to the Undertaker.
- 4.2 Investigatory works can be undertaken to determine whether a reinstatement has been carried out to the required standard. These works could typically include material testing, texture depth measurement, skidding resistance measurement and compaction testing. Investigatory works, such as testing and measurement can be undertaken during the reinstatement process but more often they will be done following completion of the reinstatement using intrusive methods such as coring or excavating trail holes.
- 4.3 In order to protect the fabric of the highway, Service Providers may undertake core sampling of all permanently reinstated carriageway excavations of Statutory Undertaker's works. If such a programme of coring is undertaken the cost of the coring for those that are subsequently found to be defective is recoverable from the Statutory Undertaker.

5 Defect and Inadequacy Inspections

- 5.1 When a reinstatement defect is identified from any of the above inspections, the following further inspections can be undertaken:
- Joint inspection with the Undertaker to agree the defect
 - An inspection during execution of the remedial works.
 - An inspection on completion of the remedial works.
- 5.2 When an inadequacy in signing and guarding is identified there is no provision for further inspections of the corrective action taken by the Undertaker. Further inspections can be undertaken if considered appropriate but the Undertaker will not be liable to pay inspection fees (as detailed below).

6 Collection of Inspection Fees

- 6.1 Inspection fees are reviewed by HAUC on a regular basis and then defined by regulation.

The following table details the charges that can be levied

Inspection Type	Charges allowed
Sample inspections	Charges will only be made for inspections carried out at the rate in the regulations for a sample inspection.
Routine inspections	No charge is made for these inspections.

Investigatory inspections	If the site is visited and a defect/inadequacy exists a fee as prescribed in regulations for a sample inspection may be claimed.
Inspection of Section 50 works	Payment should not be claimed for these inspections as the Highways Agency obtain the fee from the licence holder at the time the licence is granted.
Defect Inspections	Payment will only be made for inspections carried out at twice the sample fee in the regulations.
Inadequacy inspections	If a joint meeting is required to resolve the problem HAUC recommends a defect fee be payable if an inadequacy is confirmed
Investigatory Works	If a defect is found the actual costs of works at that site may be recovered.

- 6.2 Local instructions on invoicing arrangements will be issued to Service Providers by Service Managers. Information on the results from inspections should be sent directly to the relevant Undertaker on a monthly basis.

7 Reporting Procedures

- 7.1 Service Providers should provide reports on street works performance as required by local instruction.

Annex 6.9.1 Recommendations for Dual 4 Lane Carriageways

Five traffic management arrangements are considered including night-time only working (see Figure 6.9.1). The recommended flow ranges are given below and are summarised in Figure 6.9.2. In addition, a graph has been prepared for a typical maintenance scheme which demonstrates the general cost trends for the various options over a range of flows, and this is shown in Figure 6.9.3.

PARTIAL CONTRAFLOW, 3 + 3 LANES (P33) - Recommended range from zero to 125,000 AADT with limited application between 95,000 and 125,000 AADT. This is the quickest traffic management arrangement to install and the easiest one with which the contractor can expedite the works.

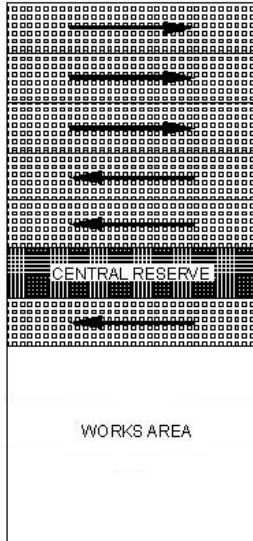
PARTIAL CONTRAFLOW, NARROW LANES, 4 + 3 LANES (PN43) – This option has a limited application range only, from 70,000 to 90,000 AADT. Inspection of the flow profiles in each direction should ensure that the four lanes are given to the carriageway with the greatest peak flow.

PARTIAL CONTRAFLOW, 4 + 3 LANES (P43) - This option has a recommended range from 70,000 to 130,000 AADT with limited application between 105,000 to 130,000 AADT. In this option inspection of the flow profiles is required prior to allocation of the four lanes.

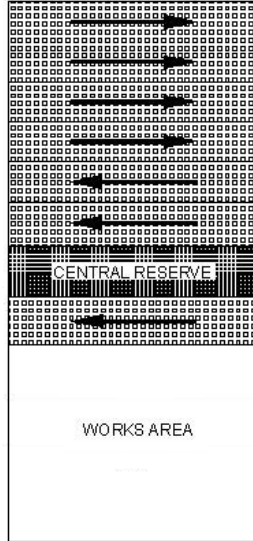
PARTIAL CONTRAFLOW, NARROW LANES, 4 + 4 LANES (PN44) - Recommended range 70,000 to 125,000 AADT with limited application between 70,000 and 90,000 AADT. This is the most expensive and complicated traffic management arrangement to install but it has the largest traffic capacity.

NIGHT-TIME ONLY WORKING (NTO), 3 + 3 LANES - Recommended range 110,000 to 200,000+AADT with limited application between 110,000 and 125,000 AADT. The use of NTO can result in increased works costs of somewhere between 10% and 25%. From around 125,000 AADT upwards, this option begins to afford significant overall cost benefits over the other options. At 170,000 AADT the overall costs are about 50% of the next best option (PN33), so that for flows approaching 125,000 AADT or more, serious consideration should be given regarding its use. At the lower end of its recommended range, the increased cost of the works becomes more significant in determining whether it should be used.

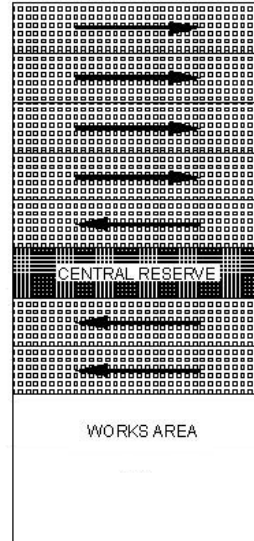
Figure 6.9.1 D4L Carriageway – Traffic Management Arrangements



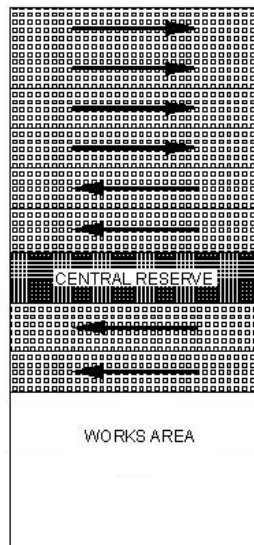
P33
Partial Contraflow, 3+3



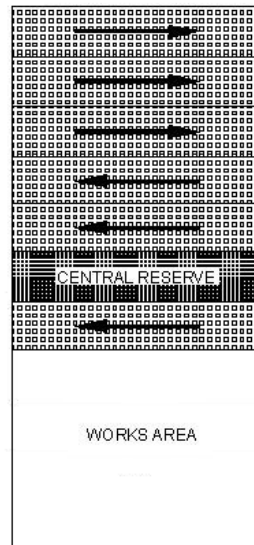
PN43
Partial Contraflow, 4+3 Narrow Lanes



P43
Partial Contraflow, 4+3



PN44
Partial Contraflow, 4+4 Narrow Lanes



NTO
Night Time Only

Figure 6.9.2 D4L Carriageway – Recommended Flow Ranges for Various Arrangements

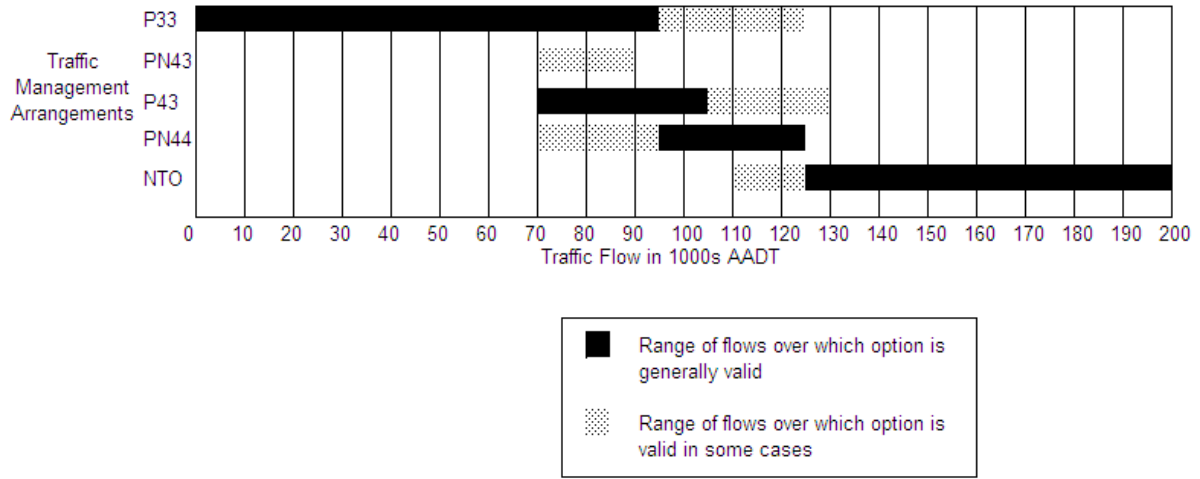
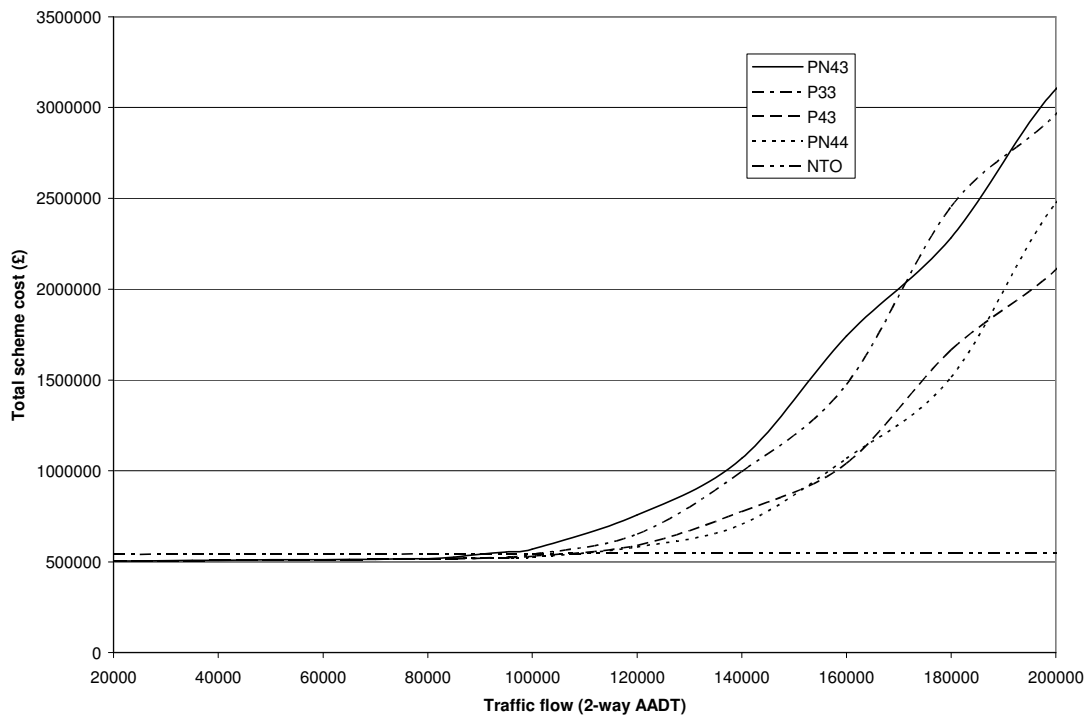


Figure 6.9.3 D4L Carriageway – Typical Maintenance Scheme showing Total Cost of Various Arrangements



Annex 6.9.2 Recommendations for Dual 3 Lane Carriageways

Five traffic management arrangements are considered including night-time only working (see Figure 6.9.4). The recommended flow ranges are given below and are summarised in Figure 6.9.5. As with the case for dual four lane carriageways, a graph has been prepared for a typical maintenance scheme which demonstrates the general cost trends for the various options over a range of flows, and this is shown in Figure 6.9.6.

FULL CONTRAFLOW, 2 + 2 LANES (F22) - Recommended range from zero to 80,000 AADT with limited application between 50,000 and 80,000 AADT. This is the quickest traffic management arrangement to install and the easiest one with which the contractor can expedite the works.

FULL CONTRAFLOW, NARROW LANES, 3 + 2 LANES (FN32) - This option has a limited application range only, from 40,000 to 60,000 AADT. Inspection of the flow profiles in each direction should ensure that the three lanes are given to the carriageway with the greater peak flow. This option can only accommodate one HGV lane in either direction due to the limitations of a standard motorway cross-section. (The absolute minimum allowable lane width for HGV traffic is 3.0m). If the HGV flow exceeds 850 vehicles per hour in either direction then the relevant HGV lane will run to capacity and excess HGVs will queue on the approach. This condition can be exacerbated by the fact that some non-HGV traffic may be using this lane, causing queues to form at lower HGV flows. Non-HGV traffic tends to use the freer flowing lane but this may not always be possible, such as when a lane serves a junction.

PARTIAL CONTRAFLOW, 3 + 2 LANES (P32) - This option has a limited application range only, from 55,000 to 90,000 AADT. If two HGV lanes are necessary in each direction, this option becomes viable again at the higher range of 145,000 to 200,000+ AADT, although has limited application between 145,000 and 185,000 AADT. It should only be chosen after the other valid options have been rejected as unsuitable. In this option inspection of the flow profiles is required prior to allocation of the three lanes.

PARTIAL CONTRAFLOW, NARROW LANES, 3 + 3 LANES (PN33) - Recommended range 55,000 to 200,000+ AADT with limited application between 55,000 and 80,000 AADT and 185,000 and 200,000+ AADT. This is the most expensive and complicated traffic management arrangement to install. It has the largest traffic capacity, although it can only accommodate two HGV lanes in one direction, and one in the other.

NIGHT-TIME ONLY WORKING (NTO), 2 + 2 LANES - Recommended range 80,000 to 200,000+AADT with limited application between 80,000 and 100,000 AADT. The use of NTO can result in increased works costs of somewhere between 10% and 25%. From around 100,000 AADT upwards, this option begins to afford significant overall cost benefits over the other options. At 185,000 AADT the overall costs are about 25% of the next best option (PN33), so that for flows approaching 100,000 AADT or more, serious consideration should be given regarding its use. At the lower end of its recommended range, the increased cost of the works becomes more significant in determining whether it should be used.

Figure 6.9.4 D3L Carriageway – Traffic Management Arrangements

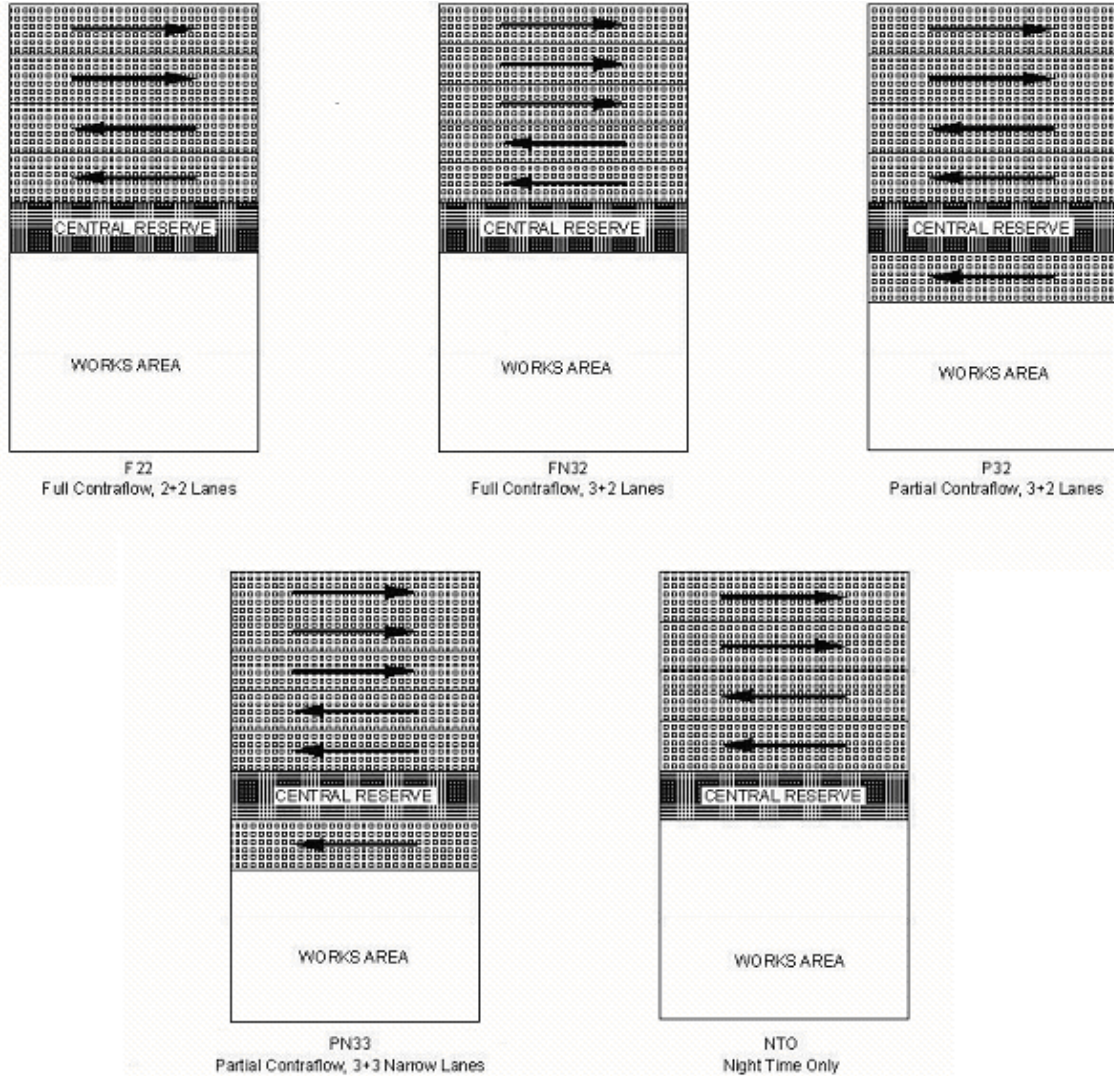


Figure 6.9.5 D3L Carriageway – Recommended Flow Ranges for Various Arrangements

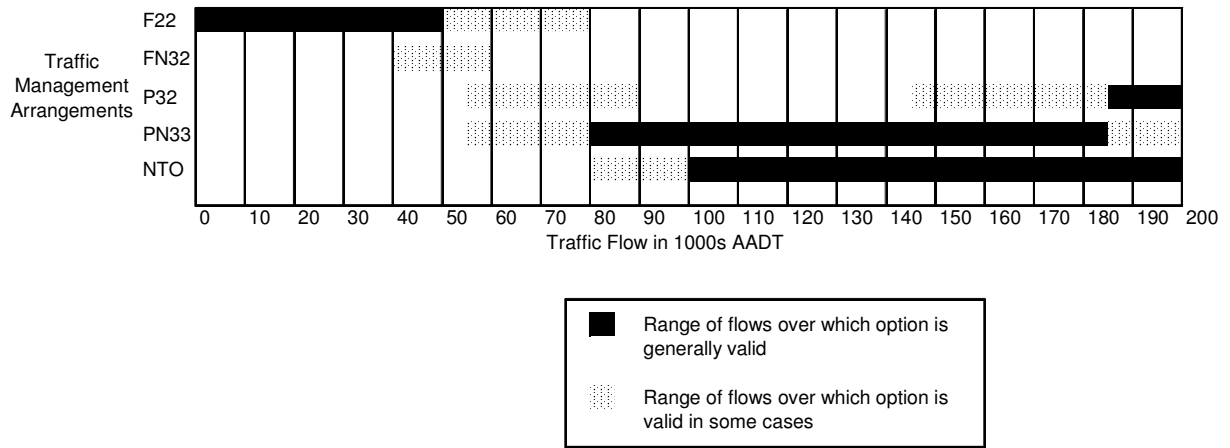
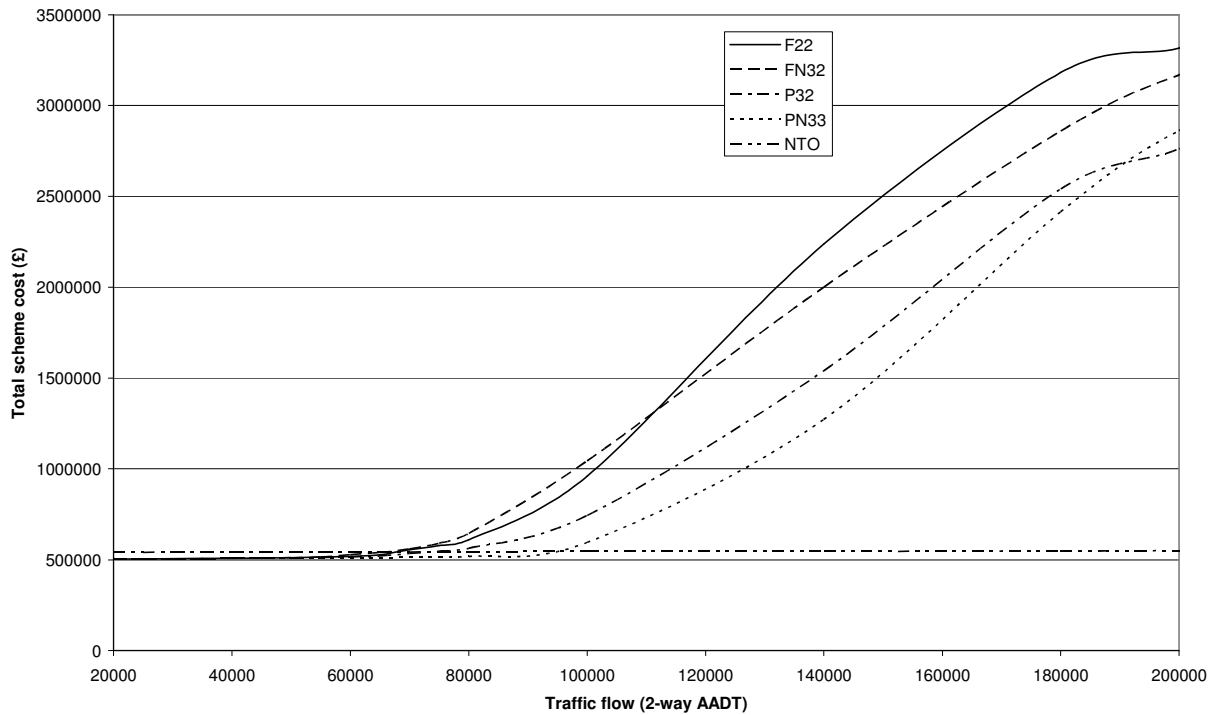


Figure 6.9.6 D3L Carriageway – Typical Maintenance Scheme showing Total Cost of Various Arrangements



Annex 6.9.3 Recommendations for Dual 2 Lane Carriageways

Four traffic management arrangements including night-time only working have been considered (see Figure 6.9.7). The recommended flow ranges are given below and are summarised in Figure 6.9.8. As with the case for dual four lane carriageways, a graph has been prepared for a typical maintenance scheme which demonstrates the overall cost trends for the various arrangements over various flow ranges, and this is shown in Figure 6.9.9.

FULL CONTRAFLOW, 1 + 1 LANES (F11) - Recommended range from zero to 45,000 AADT with limited application between 20,000 to 45,000 AADT. It is not strictly comparable with the others but it has been included because it could be employed where work is required on one carriageway and the complete central reserve.

FULL CONTRAFLOW, 2 + 1 LANES (F21) – This option has a limited application range only from zero to 25,000 AADT. This is the quickest traffic management arrangement to install and the easiest for the contractor to work with.

PARTIAL CONTRAFLOW, 2 + 2 LANES (P22) - Recommended range zero to 90,000 AADT with limited application between zero and 25,000 AADT. This is the most expensive and complicated traffic management arrangement to install but it has the largest traffic capacity. This option is also subject to works cost premium compared with the preceding options. Although this premium does not significantly affect the recommendations, it should be borne in mind at the lower end of the recommended range.

NIGHT-TIME ONLY WORKING, 1 + 1 LANES (NTO) - Recommended range 45,000 to 180,000+AADT with limited application between 45,000 and 90,000 AADT. As with the dual four lane and dual three lane examples, similar advice applies regarding the cost premium. Nevertheless, cost savings are clearly implied at flows of 90,000 AADT and higher.

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Figure 6.9.7 D2L Carriageway – Traffic Management Arrangements

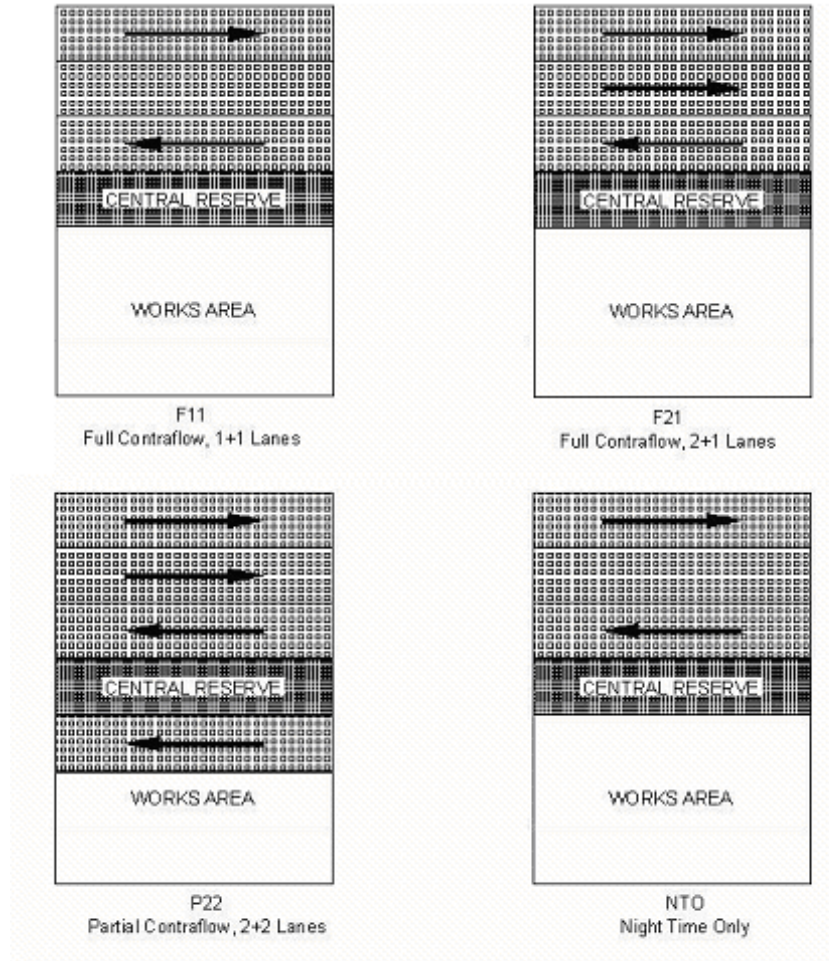


Figure 6.9.8 D2L Carriageway – Recommended Flow Ranges for Various Arrangements

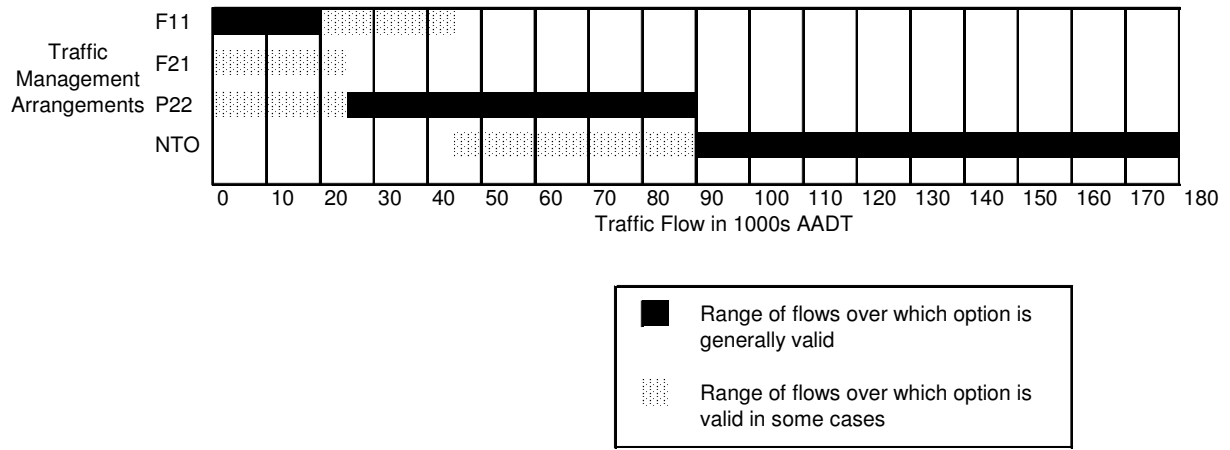
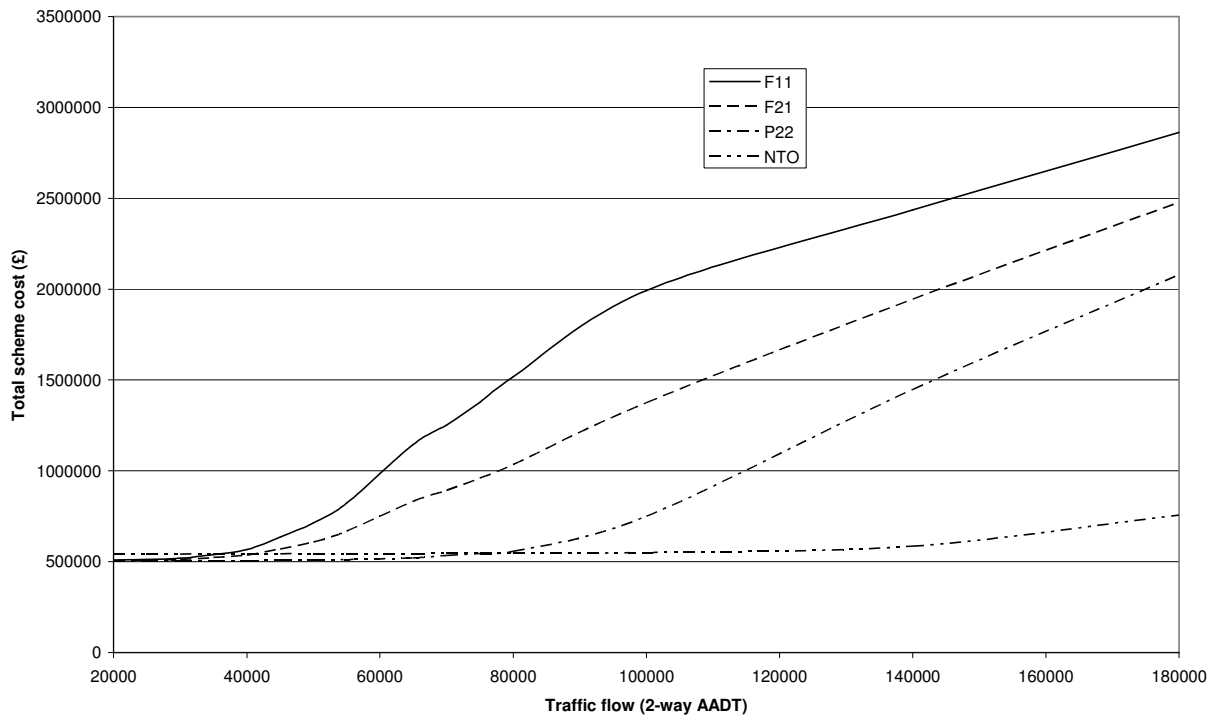


Figure 6.9.9 D2L Carriageway – Typical Maintenance Scheme showing Total Cost of Various Arrangements



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5.1 Introduction to Winter Service

This chapter provides guidance, advice and instruction to Service Providers for the delivery of an effective winter service. Service Providers demonstrate their preparedness for this by developing a Severe Weather Plan, which replaces and now includes what was previously covered by the Winter Service Plan. This is a mandatory requirement and has been included in a text box - see 5.2.1. For editing purposes other mandatory requirements contributing to that Severe Weather Plan are not included within text boxes and for this reason, some mandatory terms within this Chapter appear outside text boxes.

5.1.1 Legal Duty

The Service Provider must plan all winter services such that they meet all statutory requirements. The nature of the operation will invariably call for a degree of judgement, but that judgement may have to be defended in a court of law so it should be sound and recorded.

To reflect this, Section 41(1A) of the Highways Act 1980 was inserted on 31 October 2003, by Section 111 of the Railways and Transport Act 2003. The first part of Section 41 now reads:

- (1) The authority who are for the time being a highway authority for a highway maintainable at public expense are under a duty subject to subsections (2) and (4) below, to maintain the highway
- (1A) In particular, a highway authority is under a duty to ensure, so far as is reasonably practicable, that safe passage along the highway is not endangered by snow or ice.

5.1.2 Level of Service

The minimum standards to be achieved for winter service are given in section 2.18 of the Routine and Winter Service Code.

The Service Provider must prepare the Severe Weather Plan in order to deliver the winter service and performance standards required by the Code. As a minimum this must be:

Response and Treatment Times

Response time is **1 hour**. Response time is defined as the maximum time taken from the decision to begin treatment until the winter service vehicles are loaded, manned and ready to leave the compound.

Treatment time is **2 hours**. Treatment time is defined as the maximum time taken from leaving the compound through to returning to the compound after completion of the treatment route.

5.1.3 Winter Period

Unless otherwise agreed with the Service Manager the Winter Period from 1st October to 30th April is that during which the Service Provider must be fully prepared to undertake winter services. During this time, three risk periods are identified for operational purposes:

Risk	Months
High	December, January and February
Low	November and March
Marginal	October and April

The actual dates for the winter period may vary from year to year and the Service Provider must agree with the Service Manager by 1st July each year, the requirements for standby and /or continuous shift arrangements within each risk period. The Severe Weather Plan must include the agreed dates.

5.1.4 Role of the Highways Agency's Traffic Officer Service

The Traffic Officer Service provides an additional source of information on the state of the network in relation to traffic flow, weather and road conditions such as ice, freezing rain and snow accumulations and reports this through the Regional Control Centres.

The Traffic Officer Service may also offer a variety of support when requested by Service Providers, if operationally available. Such tasks could include aiding access for winter service vehicles through congestion, negotiating diversions and road works where Traffic Officer powers in directing traffic would be beneficial.

The potential support available is detailed in the Traffic Officer Procedures.

Service Providers must provide short winter and severe weather briefing sessions each year to the Traffic Officer Service in line with requirements in Annex 5.1.1. All briefings are to be completed by the end of October. Briefings are to be aimed at Traffic Officers and Regional Control Centre supervisors who will be responsible for cascading the information to staff during shift briefings.

The Traffic Officer Service will also take an active role in pre-winter snow desk exercises along with other winter service stakeholders.

5.1.5 Winter and Business Continuity Reporting

5.1.5.1 Introduction

Service Providers must use the winter and business continuity reporting system (WRF1) provided by the Highways Agency. The reporting system is Internet based and hosted by Atkins at the following address: <http://winter.atkinsglobal.com/winter>.

5.1.5.2 Access Requirements

Service Providers should review user access to the WRF1 system (data entry and read-only) and provide details of new users and historic accounts to be closed to wm_nart@highways.gsi.gov.uk.

At their discretion Service Providers should request individual user names and passwords for stakeholders to allow read-only access to the system. A valid email account is required for those stakeholders who require automatic notification of WRF1 reports.

5.1.5.3 Additional Services

Atkins will provide a call centre facility to enable Service Providers to submit winter service decisions in the event of system failure. The telephone number of this call centre is: 0870 2411538. This service is available 24 hours a day seven days a week (including Bank Holidays) throughout the winter season.

However, Service Providers are still required to ensure that a backup facsimile system can be implemented in case of such a failure. (Manual reports should be faxed to the Highways Agency using 0121 678 8510).

5.1.5.4 Winter Reporting

Service Providers must use the on-line electronic winter reporting system (WRF1).

Service Providers must keep the WRF1 system up to date during the Winter Period with the state of the Network and treatment decisions to ensure that the information is a true and accurate representation of the current situation.

The WRF1 system has two objectives:

1. Record of Decisions – The WRF1 system will provide the Highways Agency, its Service Providers, Traffic Officer Service, local authorities, police services and other winter stakeholders with up-to-date information on the state of the network, business continuity and weather related incidents.
2. Confirmation of Treatments – The WRF1 system will provide the National Winter Team and NetServe with information to allow them to take a strategic overview of the network. The data is also used to assist in the measurement of performance and is used to inform various research projects.

To satisfy the first objective, Service Providers are reminded that the WRF1 is a “live” system and therefore they must record their winter service decisions, within 30 minutes of making them, as and when conditions change on the Network seven days a week. As a minimum reporting requirement, by 16:00 hrs a Full Report must be recorded on WRF1 which details the proposed actions to be undertaken by the Service Provider. If there has been no change to the Service Providers’ decisions over the previous 24 hour period, then a “No Change” report must be recorded.

To satisfy the second objective, an Update Report must be recorded on WRF1 to confirm all the actions undertaken by the Service Provider since the submission of the last Full Report. As a minimum reporting requirement this must be completed by 10:00 hrs on the following day.

The information recorded on WRF1 will be used to inform the Highway Agency’s management of the state of the network. It is essential therefore that submitted reports reflect the true conditions of the network and are not simply updates of the weather.

Service Providers will be able to enter treatments in any denomination, not just 10, 20, or 40gms/m².

Where multiple treatments are proposed, Service Providers should select ‘*Multiple*’ from the available treatment options and record the time of the first treatment. When the last treatment has been completed, Service Providers should submit a second report selecting *Completed* from the treatment options and recording the time when it was completed.

Service Providers will only be required to provide Road Surface Temperatures, air temperatures are no longer required.

Detailed information on non-weather related incidents are not required on the WRF1 system (other than to note that the route is affected by an incident).

Archived information can be easily accessed for winter season audit reviews.

There will be a direct link from WRF1 to the Highways Agency website.

Records may be used for hot or cold de-briefs and therefore it is essential that the recorded information is complete and accurate.

5.1.5.5 Winter Reporting during Severe Weather Desk (Adverse Weather) Conditions

During Severe Weather Desk situations an Adverse Weather Report must be recorded by the Service Provider on WRF1. This is a simplified report, reducing reporting requirements during such periods of increased activity, and the frequency of submission on WRF1 should be in accordance with the Service Provider's Severe Weather Plan. This reporting regime will remain in place until the Service Provider stands the Severe Weather Desk down.

5.1.5.6 Business Continuity Reporting

Service Providers must also submit a Business Continuity Report on WRF1 by 16:00hrs on a daily basis during the Winter Period. As a minimum reporting requirement, salt stock capability and reserve fleet levels should be recorded. When there is a possibility of fuel disruption, compound fuel status should also be recorded.

There are three basic reports that require completion; salt stock capability levels, compound fuel levels and reserve fleet details. Details for completion of each report are as follows:

- Salt Stock Capability Levels

The purpose of monitoring salt stock levels is to provide an early warning system to allow critical stock levels to be identified. Daily salt stock monitoring is essential so that any stock issues are addressed to ensure operational resilience. It is required that decimal values be rounded down to the nearest whole number. Comprehensive guidance on salt stock monitoring and reporting can be found in Section 5.1.6 and Annex 5.1.2.

- Compound Fuel Levels

In accordance with paragraph 2.2.3.2 of the Severe Weather Plan template, Service Providers are required to monitor fuel stock levels regularly during the Winter Period.

When there is a possibility of disruption of fuel supply or when stocks are low then the Service Provider should use the WRF1 reporting system to highlight the situation to the Highway Agency and other areas in order for the situation to be reviewed. The system is based on a red, amber and green rating. Fuel levels are expected to remain green until such time that the Service Provider feels service resilience is under threat. An amber alert should be activated when the Service Provider becomes aware of any potential threat to stocks. This is then to be elevated to a red status when the service is actually being affected.

- Reserve Fleet

Service Providers are requested to update the location of their reserve fleet (salt spreaders and snow blowers) on a daily basis or when the situation changes. Temporary movement of fleet or longer term relocations can now be recorded.

5.1.5.7 Email Communications

The WRF1 will automatically generate email alerts when a Service Provider submits a report recording winter service decisions or a Severe Weather Desk has been called or stood down. It is suggested that Service Providers create their own functional email account from where they can manage their stakeholder distribution list.

5.1.5.8 Geographical Information System (GIS) Web Based Mapping

Web based GIS mapping, which does not require additional software, is available from WRF1 and can be accessed from all data entry pages or from the Reports Menu. The map layers show current actions, predominant weather conditions, weather related incidents, gritting routes and business continuity information. Improvements have been made in order to speed up the functionality of the mapping.

5.1.5.9 Training

A user guide is available on line and a detailed training manual in Adobe PDF format may be downloaded from the WRF1 website to further assist training and gives guidance on system changes. However, if further training is required this may be requested via Ray Farlow of Atkins on 0121 483 5402.

5.1.5.10 Further Information

The WRF1 system is user friendly, however if new users require further guidance on the use of this facility or additional user id/passwords are required, please contact: Rachel Walton (Highways Agency), Tel: 0121 678 8538, e-mail: wm_nart@highways.gsi.gov.uk

5.1.6 Strategic Salt Stock Monitoring

The Service Provider must routinely monitor salt stocks during the winter period and report salt stock capability levels as part of the established daily winter service reporting procedures using the on-line electronic reporting system, WRF1. Daily reporting must commence on 1st October and end on 30th April. Full details of the procedures are provided at Annex 5.1.2.

5.1.7 Winter Service Resources

Effective winter service may be achieved through the co-ordination actions of trained and appropriately qualified staff. The Service Provider must ensure that the equipment and depots operate efficiently. The Service Provider must prepare the equipment (including calibration where required) and the depot facilities in advance of the Winter Period, so there is no delay if bad weather occurs earlier than expected, and undertake proper and effective maintenance of all equipment throughout the winter period.

The Highways Agency will make available compounds, vehicles, plant and equipment as appropriate to the form of contractual arrangement and may make available additional reserve resources if the Service Provider requires them due to breakdowns or severe conditions.

The Service Provider will provide other resources including staff and materials as required. The Severe Weather Plan must detail all resources available for delivery of an effective winter service on the Network and include procedures for mobilising reserve items.

5.1.8 Liaison and Communication Arrangements**5.1.8.1 Liaison**

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The management of the interface between the trunk road network and other networks is essential to the consistent provision of winter service.

The Service Provider must discuss with adjacent authorities and private network managers (including motorway service areas, airport/ rail roads) to agree interface management arrangements at the onset of each winter season. As part of these discussions the Service Provider must highlight parts of other networks that are important to its operational effectiveness and that of the Highways Agency

Provision of mutual aid and design of winter service treatment routes including cross-boundary arrangements are dealt with in chapter 5.4

Clear lines of communication must be established, contact names and telephone numbers agreed and all documented in the Severe Weather Plan such that communication is possible at all times.

5.1.8.2 Network contact details

Contact details for the principle staff involved in the delivery of the winter service must be provided. This should include out of hours contact details where appropriate. Details of all adjacent Highway Authorities and other service providers must be included as well as emergency services details.

5.1.8.3 Service Provider Communication

The Service Provider must provide and maintain an effective telecommunications system between the Service Manager, the Service Provider's supervisory staff and winter service vehicles during the winter period. Mobile telephones communication must not be relied upon since these can become over loaded particularly during extreme winter weather, or in the event of an incident causing major congestion.

Full details of the communication system for winter service vehicles and the back-up communication system for winter service vehicles must be included in the Severe Weather Plan.

When considering the provision of a dedicated telephone number for inclusion in the Severe Weather Plan, the Service Provider should consider combining this with other requirements such as those in connection with incident management. Substantial operational benefits can be obtained by providing a permanently manned control centre to co-ordinate the Service Provider's work.

5.1.9 Records

A comprehensive set of records must be maintained by the Service Provider in accordance with the Severe Weather Plan. Records are required to defend against liability claims made in respect of winter service and it follows that they need to be high quality.

5.2 Severe Weather Plan

5.2.1 Introduction

The Service Provider must prepare a Severe Weather Plan which must be submitted to the Service Manager on or before 21 August each year. The Service Manager will review and comment on the Severe Weather Plan on or before the 18 September each year.

The Severe Weather Plan template is detailed in Annex 5.2.1 and must be followed. The plan describes the different activities undertaken as part of winter service including, details of procedures, resources and contact information.

5.3 Weather Information

5.3.1 Introduction

The primary requirement of winter service is to provide safe passage for road users by keeping the Network free of ice and snow and open at all times. However the Service Provider must always aim to achieve this with as little impact as possible on the environment. This involves providing the correct level of treatment (spread rates, timings and frequency) at all times and minimising unnecessary treatments. To do this the Service Provider requires a robust information system to provide it with accurate real-time data on both weather forecasts and actual road conditions.

The Highways Agency's Road Weather Information System, RWIS, (see 5.3.3 below) provides a level of service that, when further enhanced by the provision of thermal maps (see 5.3.6) and a regular weather forecasting regime (see 5.3.2), enables the Service Provider to make informed decisions based on forecasts and then to monitor and update them should actual conditions change.

The road weather forecasts described below must be obtained by the Service Provider daily, including weekends and public holidays throughout the Winter Period. The name of the forecasting organisation, the date and the time of issue must be recorded with all forecasts.

5.3.2. Weather Forecasting

5.3.2.1 24 Hour Forecast

A forecast for the following 24 hours should be obtained between 1200 hours and 1600 hours, or at an alternative time if specified in the Service Provider's contract. The text of this forecast should include:

- A general synopsis, with timings, over the following 24 hours
- Minimum air and road surface temperature predictions for agreed climatic/administrative zones and the timing of zero crossing if appropriate
- Relative humidity and dew point, including a warning of any predicted combination of low temperature and low humidity conditions
- The likelihood and timing of any precipitation or deposition on road surfaces
- If snow is forecast, its timing, amount and type and the direction from which the snow will develop, the likelihood of drifting and the height above which accumulation is likely
- Visibility – danger of thick fog (<200 m visibility) or freezing fog formation, the location and timing
- Wind speed and direction; gale warnings and timing
- Confidence level in the forecasts (low, medium or high)

5.3.2.2 2-5 Day Forecast

A 2-5 day forecast should be obtained with the 24 hour forecast. The text of this forecast should include:

- A general synopsis and anticipated trends over the period
- Specific condition reports for day/night of days 2 and 3
- Confidence level in the forecasts (low, medium or high)

5.3.2.3 Site Specific Forecasts

Where information is received from road weather sensors, detailed 24-hour site specific forecasts should be obtained between 1200 hours and 1600 hours, or at an alternative time, where specified in the Service Provider's contract. These forecasts should include:

- Graphical representation, against time, of predicted road surface temperatures and surface condition.
- Textual site specific forecasts, including thermal map type and confidence in the forecast.

5.3.2.4 Evening Update of Forecasts

If minimum overnight road surface temperatures are expected to be below +4°C, an update of the 24-hour forecast and of the site specific forecast, including advice of "no change" if appropriate, must be obtained between 1800 hours and 2200 hours or as otherwise specified in the Service Provider's contract. An update may be appended to the end of a previous forecast.

5.3.2.5 Further Updates of Forecasts

The Service Provider must ensure that the forecasting organisation notifies it immediately, and specifically, of any change in previously forecast conditions. In particular, any change relating to snow, be it an improvement or a worsening of predicted conditions, must be reported immediately and all forecasts updated, including the 2-5 day forecast.

5.3.2.6 Morning Summary

A morning summary should be issued by 0900 hours. The text of this report should include:

- A morning summary of weather over the previous 16 hours (1500 hours to 0900 hours)
- A brief forecast for the following 24 hours, valid until issue of the 24 hour forecast
- Notification of any suspected faults in the road weather information system, if such a system is in operation.

5.3.2.7 24 Hour Consultancy Service

The Service Provider should ensure that the forecasting organisation is available by telephone 24 hours a day, 7 days a week for consultation on the weather conditions and details of forecasts. The Service Provider should ensure that the forecasting organisation provides a response within five minutes of any enquiry from the Service Provider.

5.3.2.8 End of Season Analysis

At the end of each winter season the Service Provider should ensure that the forecasting organisation produces an end-of-season analysis of the accuracy of forecasts based on information contained in the RWIS. For each forecast site this analysis should include:

- A graph of actual versus forecast minimum road surface temperatures
- A pie-chart detailing the frost prediction accuracy by comparing forecast frost against actual frost conditions (i.e. frost/frost, frost/no frost, no frost/frost or no frost/no frost)
- The bias and root mean square error in the forecast of minimum road surface temperature.

The Service Provider should retain copies of the analysis and make them available to the Service Manager if required.

5.3.2.9 Level of Accuracy

The accuracy of road weather forecasts should be no less than 90%. Calculation should be on the basis of the percentage of predictions in the "no frost/no frost" or "frost/frost" categories for the winter nights considered, when the observed minimum road surface temperature at a forecast site is +4°C or below. If an update has been issued before midnight, it should be used in the analysis even if it is less accurate than the original forecast.

5.3.3 Road Weather Information System

The Road Weather Information System (RWIS) which now covers the whole of the trunk road and motorway network obtains information from meteorological outstations. Provision of weather forecasts, the continuous monitoring of actual conditions and determination of winter operations can be provided through accessing the RWIS. The service is procured centrally by the Highways Agency through three separate contracts, namely:

- **The Bureau Service;** a centralised data management service which manages and enables the flow of forecast and roadside weather outstation data between the forecasting organisation and the Service Provider's offices and Regional Control Centre, to allow the remote monitoring of road surface and atmospheric conditions for the detection and prediction of ice formation and other adverse weather conditions;
- **The Operation and Maintenance Service** which maintains and operates the network of outstations and ensures that inspection, calibration, maintenance, repair and modification works are carried out as required, and
- **The Supply and Installation Service** which provides for the supply, installation, testing and commissioning of new outstations which are then integrated into the existing system. This service includes both new outstations and the replacement of old or damaged outstations.

Two standard communication protocols are used by RWIS, namely

- Department for Transport Specification TR2020C (further information available by email from tss_plans_registry@highways.gsi.gov.uk), for the link between the Bureau and the forecast organisation, and
- A modified version of BUFR, an open worldwide meteorological protocol, which allows the transmission of visual images, for the link between the outstations and the Bureau.

These open protocols ensure that ice prediction systems/outstations designed and installed by different companies communicate in a common language with the weather forecasting data collection systems.

In order to ensure that the RWIS is completely effective, roads should be thermally mapped (see 5.3.6) to identify their temperature profiles and any environmental characteristics that could lead to variations in road surface temperature. Thermal mapping in turn will assist in deciding the most appropriate location for outstations and road sensors.

5.3.4 Site Selection of Outstations

The trunk road and motorway network is covered by RWIS outstations, which have been located to best suit the weather domains throughout the trunk road and motorway network. The decision on where to site a new outstation includes all stakeholders in the RWIS as it is dependent on the variability of paved surfaces and elements in both time and space. Before starting on the process of site selection, careful consideration should be given to the use that will be made of the data. Likely applications are:

- Providing information for forecasting and for monitoring the progress of weather changes and comparing actual conditions with those forecast
- Monitoring conditions at sites where road conditions may be significantly different from those on most of the road network or where there is a special need for accurate information on road conditions

For the first application the sites are usually typical of the majority of the road network within that particular weather domain, be well exposed to wind and weather but not on steep slopes. A full set of road surface sensors and meteorological sensors are installed at such sites. Information from these representative sites comprises the necessary input for forecasting road surface conditions.

The second application is, in general, related directly to the needs of the Service Provider. For example, it may be thought desirable to have accurate information on road conditions near a bus station or hospital (even if those areas are neither very well exposed nor likely to be particularly cold), on a bridge that has a thermal response that is very different to the majority of the road network or in a low-lying area into which cold air can drain from the surrounding high ground. Such locations are likely to require only road surface sensors.

5.3.5 Organisational Changes to Maximise the Benefits of RWIS

Installing a RWIS and carrying out thermal mapping will not automatically lead to economies in Winter Service. Consideration also needs to be given to how application of the technology can enhance the efficiency of winter service routes, staffing and shift manning arrangements. For example, a stand-by shift may be replaced by a call-out shift arrangement and inspection patrols reduced or eliminated.

5.3.6 Thermal Mapping

Thermal maps are procured by the Service Manager and are not included in the RWIS contracts. All sections of the trunk road and motorway network have now been thermally mapped but new additions to the Network or changes to pavements following maintenance may need to be mapped/re-mapped. The specification for thermal mapping is set out in Annex 5.3.1.

When using thermal maps it is important to recognise that the road surface temperature varies in both space and time. It is dependent on certain factors such as altitude, topography, road construction and sky-view factor, and on variable factors such as traffic density, and weather conditions. To cover all these variations there are usually three types of base thermal map produced; extreme (clear sky), intermediate (partial cloud) and damped (cloudy).

Thermal maps, which depict the spatial variations in minimum road surface temperature, provide an indication, for the above three weather conditions, of how the minimum road surface temperatures at all mapped points on the road network are related to the minimum road surface temperature at those points where measurements and/or forecasts are available at outstations. Three different versions of the map are usually available each night to assist the decision making process:

- A map showing the minimum temperature based on the forecast for a particular outstation
- A map showing the forecast changes for each hour through the night
- A real-time thermal map giving actual measurements on an hourly basis through the night.

5.4 Winter Service Route Planning

5.4.1 Introduction

The Service Provider must review its designed winter service routes (WSR) annually to ensure that changes in the Network are considered and that WSR are optimised to be as efficient as possible in terms of treatment lengths and time to complete treatment.

The Service Provider should take into account the traffic level on the WSR to avoid, where possible, the peak periods of use and the potential need for different requirements on different lanes of the carriageway. The use of computer software can significantly improve WSR optimisation and allow for adjustments to WSR to be made quickly and easily while maintaining a high level of efficiency. This is particularly effective if short-term changes occur such as temporary road closures or other traffic management.

5.4.2 Liaison with adjacent Highway Authorities and Service Providers

The Service Provider must liaise closely with adjacent Highway Authorities and other service providers when designing WSR to ensure consistency and continuity of winter service operations on all sections of the Network and with adjacent highway networks. The Service Provider must inform and keep informed adjacent Highway Authorities and other service providers of any changes to WSR.

Particular attention should be given to liaison with adjacent Highway Authorities for treating diversionary routes. If the diversionary route is outside of the Service Providers Network then the Service Provider is required to agree the treatment operation with the adjacent authorities.

5.4.3 Mutual Aid Arrangements

Mutual aid can be many different things, from the sharing of resources such as salt, the sharing of facilities that may provide a better coverage of the Network, or the provision of a full winter service to a particular part of another network. For example, there are local roads that Service Providers may treat to ensure their own operational effectiveness such as access routes to depots.

Mutual aid arrangements, including cross boundary agreements, will help to ensure that the winter service provided on the country's road network is consistent and seamless to the road user. The Service Provider must therefore ensure that all such arrangements are documented and disseminated to all operational staff for their action.

Mutual aid arrangements can also be used to provide support to, or obtain support from, other network operators during times of stress, such as during severe weather, to the benefit of the road user. As part of pre-season discussions the provision of support at such times and capabilities of provision should be discussed and contact details agreed.

Whatever mutual aid arrangements have been made, when deciding whether to provide support to others the Service Provider should consider the possible effect on the Network. All requests for support from, or to, other network operators and subsequent decisions, with reasons if necessary, should be documented.

5.4.4 Cross Boundary Agreements

The Service Provider must ensure that the arrangements for winter service at the interface of the Network and other service providers and Highway Authorities networks, are documented in the Severe Weather Plan.

This agreement may include, the location (extent), type (including spread rate) and timing (particularly relevant when considering access to depots) of treatment. Such agreements should help to ensure a consistent service that will not leave potentially important sections of either network isolated.

5.4.5 Liability

The Service Provider must note that where arrangements are made with other service providers or Highway Authorities for winter service operations to be provided by them on the Network, it is the responsibility of the Service Provider to ensure that such service has been carried out. Mutual aid arrangements do not absolve the Service Provider's obligations.

5.4.6 Network Components

The Severe Weather Plan must identify components under 5.4.6.1 to 5.4.6.3 that are within the Network. Components, where treatments to be undertaken under given conditions are different, must be identified. Examples of components that may require different treatments are given below.

- Network carriageway by route/road hierarchy.
- Major structures (by road hierarchy)
- Footpaths by hierarchy (including pedestrian areas)
- Cycle tracks
- Footbridges/underpasses
- Lay-bys
- Special sites or features (e.g. near railways, traffic calming, tunnels; bridges requiring specialised treatment).
- Other miscellaneous sections
- Locations of solid concrete safety barrier

The information provided should also highlight boundary interfaces and the organisation responsible at those locations. See Chapter 5.1.8 for advice on liaison and communication arrangements with these organisations.

5.4.6.1 Snow Gates

Procedures for operating snow gates must be agreed with the police and included in the Severe Weather Plan.

The Service Provider must close and subsequently re-open snow gates only upon receipt of instructions from the Police. Should the Service Provider consider that snow is rendering or has rendered the road unsafe to vehicular traffic, a request should be made that the Police initiate procedures to close the snow gates.

5.4.6.2 Snow Fences

Powers to erect snow fences, and to establish easements, are provided in the Highways Act 1980. Negotiations of terms for the procurement of easements from landowners and tenants should be undertaken by the Service Provider in consultation with the Service Manager. Cases where agreement cannot be reached should be referred to the District Valuer. For guidance on the design and location of snow fences, the Service Provider should refer to the Service Manager.

5.4.6.3 Snow Storage

The Service Provider must identify locations where snow removed from the Network is to be stockpiled, and arrange for provisional approval by the relevant bodies for the use of the locations by 1 August each year, or such other date as agreed with the Service Manager for submission in the Severe Weather Plan.

5.4.7 Winter Service Route Design**5.4.7.1 Introduction**

The Service Provider must design all carriageway WSR to ensure that all physical constraints on the Network such as gradients, widths, radii, traffic calming features, operations near railways and the like are identified and taken into account in the design of routes and plans for the deployment of resources.

The Service Provider must allow for variations in anti-icing/de-icing material, application frequency, spread rates (either due to carriageway type or weather conditions), spread patterns, free running and wastage factors. The design must allow for variations in traffic flow and poor weather conditions to ensure that complete coverage of the Network could be achieved within the times stated in the Severe Weather Plan. This must include all carriageway marginal strips adjacent to carriageways, motorway hard shoulders, width variations, bus and other dedicated traffic lanes, footways, cycle tracks, slip lanes to motorway service areas and the interfaces with adjacent highway networks whether they are within, adjacent to or separated from the main carriageway.

The Service Provider should prepare WSR drawings to a scale suitable for clearly detailing the above items. Schedules should also be prepared for each WSR drawing.

The advice and instructions, through WSR drawings and other information, used by operatives must be robust in the event of the documents being required to be used in defence of a third party claim.

5.4.7.2 Carriageways

Designs of WSR for anti-icing/de-icing precautionary treatment, should allow for full coverage of the specified or instructed rate of spread of anti-icing/de-icing materials over the full width of all areas of carriageway. For hard shoulder or carriageway marginal strips anti-icing/de-icing material coverage should be at 50% of the full rate of spread required to meet the requirements as detailed in the Routine & Winter Service Code.. The Service Provider should give consideration to the creation of a simple database of start and finish times to enable reports to be quickly generated and provided as required by the Service Manager.

The Service Provider must design snow clearing WSR for carriageways on the Network taking into account the requirements detailed in the Routine & Winter Service Code

5.4.7.3 Footway, cycleways, pedestrian and equestrian areas

The Service Provider must design WSR for footways, cycleways and other areas used by pedestrians, cyclists and equestrians, in conjunction with local highway authorities.

In order to facilitate integration of service with local highways authorities, the categorisation described in the Roads Liaison Group document 'Well Maintained Highways – Code of Practice for Highway Maintenance Management' should be adopted. This categorisation is described in the following table.

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Table 5.4.1 Footway Categorisation

Category No	Category Name	Brief Description
1a	Prestige Walking Zone	Very busy areas of towns and cities with high public space and streetscene contribution.
1	Primary Walking Route	Busy urban shopping and business areas, and main pedestrian routes.
2	Secondary Walking Route	Medium usage routes through local areas feeding into primary routes, local shopping centres, etc.
3	Link Footway	Linking local access footways through urban areas and busy rural footways
4	Local Access Footway	Footways associated with low usage, short estate roads to the main routes and cul-de-sacs

Categorisation should be agreed with local highway authorities where the Network adjoins their network. Footway and/or cycleway facilities that are specifically promoted by the Highways Agency or local highway authority should be included within Category 1. Consideration should be given to facilities that, for example, are promoted within route management strategies and Local Transport Plans or have specific signing schemes in place ('specific signing schemes' refers to signed 'routes' rather than the normal signing of facilities dedicated to pedestrians or cyclists). Such routes should only be re-categorised where they serve business, commercial or educational facilities. Promoted routes that are recreational in nature would not normally merit re-categorisation.

It should be noted that footways on trunk roads are generally associated with low usage and will therefore usually fall into Category 4. Category 1, 2 and 3 footways will not be commonplace on the Highways Agency's network.

Where there is a particular identified high risk of accident resulting from the formation of ice, that section of footway should be Category 1. For guidance, situations where an accident is more likely to happen than not would merit re-categorisation. An example of this would be a footway on a steep gradient where walking in icy conditions would not be possible. Footbridges and associated access ramps and walkways should also be reviewed and considered for re-categorisation.

Categorisation of facilities for cyclists and equestrians should be undertaken on the same basis as the defined footway categorisation and, where appropriate, in conjunction with the local highway authority.

Treatment & Snow Clearance

The timing and type of treatment should be coordinated and agreed with local highway authorities to ensure that footways and cycleways are treated consistently along their length.

Such agreement with local highway authorities must be based on the principles contained within the Treatment & Snow Clearance Table 5.4.2 but variation from the defined treatments is acceptable on a local basis. However, where a local authority has chosen not to undertake any treatment at all, it is not acceptable to follow their approach.

Where a footway or cycleway facility is wholly within the Network and there is no interface with the local highway authority network the requirements within Table 5.4.2 below will apply.

Table 5.4.2 Treatment & Snow Clearance Table

Category	Overnight Frost Conditions	Daytime Frost Conditions	Extended Frost Conditions	Snow Events
	<i>overnight forecast temperatures below zero but not extending beyond 8am</i>	<i>overnight forecast temperatures below zero extending beyond 8am</i>	<i>forecast temperatures remaining below zero throughout daylight hours</i>	
1a	Precautionary treatment		Monitor and further treatment as required	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 12 hours of cessation of snowfall, subject to availability of resources
1	No treatment	Reactive treatment (by 8am of that same day)	Monitor and further treatment as required	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 24 hours of cessation of snowfall, subject to availability of resources
2	No treatment	Reactive treatment (by 8am of that same day)	Monitor and further treatment as required	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 48 hours of cessation of snowfall, subject to availability of resources
3	No treatment	No treatment	Reactive treatment (by noon of that same day)	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 5 days of cessation of snowfall, subject to availability of resources
4	No treatment	No treatment	Reactive treatment not normally undertaken other than in response to specific circumstances	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 5 days of cessation of snowfall, subject to availability of resources

5.4.8 Traffic Calming Areas

5.4.8.1 Introduction

The advice in this section has been prepared from the findings of an extensive study to identify issues associated with perceived difficulties in carrying out effective winter service operations where traffic-calming measures have been introduced on the trunk road network. The research

project studied experience amongst Service Providers in England and Local Highway Authorities in England and Road Authorities in Scotland. It also reviewed experience in a number of overseas countries.

The research concluded that the range of traffic calming measures adopted is extensive and that most authorities have not experienced significant problems. There have however been difficulties in carrying out effective winter service in certain situations and the Service Provider should be aware of possible measures to assist the delivery of the required level of service.

It should be borne in mind that traffic calming features have been used for a relatively short period of time during which time winter weather conditions have seldom been severe. Caution should therefore continue to be exercised when planning winter service operations in the vicinity of traffic calming features so that they are likely to be adequate in all reasonably foreseeable conditions.

The advice at this stage concentrates on short-term issues and remedies, but also indicates possible options to deal with issues more effectively in the longer-term. The Service Provider is advised to be alert to the effectiveness of its operations and ensure that adequate information and feedback on their experiences is provided to the Service Manager.

5.4.8.2 Traffic Calming Sites

The range of traffic calming measures installed on trunk roads in England to include:

- Speed cushions
- Two-way chicanes
- Central refuges
- Traffic islands
- Road narrowing
- Over-run areas
- Rumble strips and
- Road markings.

With the exception of road marking techniques to influence traffic speeds all the features are likely to involve some level of conflict with the winter service operation. Conflicts may be in terms of some form of step in the carriageway, impacting on ploughing operations, or in terms of deflection or narrowing of the carriageway, which will also complicate ploughing operations.

For example, overrun areas are used to give large vehicles more road width and can have a step height of 15mm with a total height that can be as high as the kerb. The general location is signed as part of the roundabout or horizontal deflection with no specific signing of the overrun area so their presence may not be clear if the feature is buried under snow. Snowplough drivers should be made aware of where overrun areas are installed on a given route. Similarly, anti-icing/de-icing of cycle by-pass lanes located at the nearside of traffic islands can also be a problem.

Despite the apparent conflict between traffic calming features and winter service operations, there have been relatively few reports of damage occurring to either the traffic calming feature or to equipment on snowploughs. In addition, there have been no reports of lack of effectiveness of the winter service treatments. This may be due to limited reporting of experience to date or to the care being exercised by winter service teams.

The Service Provider must be aware of the location of the various traffic calming sites on their sections of the trunk road network. Across the trunk road network as a whole, different types of features may occur singly or in combination at any site. Designs of traffic calming features must be simple and not over elaborate in areas of high snowfall.

The range of types of feature is normally quite variable and care needs to be exercised to ensure that appropriate measures are taken for winter service operation to be effective.

5.4.8.3 Locating Traffic Calming Features

Advance Warning Signs

There are few general requirements or regulations for advance signing of traffic calming features on the highway. The exception is road humps, including speed cushions, which require signing in advance of the first measure but each hump or cushion in a series does not require an individual sign. As rumble strips do not stand out visually from the rest of the road surface no signing is required. Moreover, rumble strips are not a problem if their height complies with Traffic Calming Regulations.

Gateways act as general advance warning for all features.

In the absence of the need for general regulatory signing of traffic calming features, Service Providers may use other forms of marker to assist the vehicle operators in identifying the existence of a feature. It is important however that such markers do not infringe traffic sign regulations and thereby constitute an obstruction within the highway.

It appears that many Service Providers do not feel there is a need for advance marking of traffic calming features because the detailed local knowledge of their vehicle operators ensures that the precise location of the feature is well understood. This approach should be reviewed as it puts pressure on the operatives during what can be difficult conditions.

Vehicle operatives must be able to identify features in all reasonably foreseeable conditions and circumstances. In particular the Service Provider should ensure that:

- Advance warnings signs used to identify existing features meet any regulatory requirements and are clear unambiguous, well referenced, understood by the providers and are clearly represented on route plans.
- Existing arrangements offer an appropriate high level of confidence for precise identification of the features in all conditions.
- Locations and types of newly-installed traffic calming features should be disseminated to winter service operational staff.

(The above criteria should be used to check existing signs at traffic calming sites on the Network).

Physical Warning Systems at the Traffic Calming Feature

There are no requirements or regulations for signing the actual position of traffic calming features on the highway with the exception of providing bollards at islands and refuges.

Warning systems at the traffic calming feature may, in isolation, be of limited value to the spreader driver because of closeness to the feature before being able to take any necessary action. If such markers are provided at each kerbside in addition to advance warning signs, they could serve a useful function in confirming the actual position of the feature when covered by snow. Experience appears to suggest that markers are not always required, but the effectiveness of the arrangements

should be kept under review. Marker posts will almost certainly not be required when an individual calming feature consists solely of markings or rumble strips.

If considered to be useful, marker posts should be of types that are unique and distinguishable from any other form of roadside marker in the area. There is no current requirement for designers to use marker posts at calming features but the Service Provider should:

- Use judgement based on local experience to decide if such markers are necessary at traffic calming features to ensure the winter service operation is carried out satisfactorily
- Ensure that marker posts have reflective faces in accordance with TSRGD and that the marker posts are set back from the carriageway in accordance with the Traffic Signs Manual
- Ensure route consistency in respect of marker post selection and setback from the carriageway.

(The above criteria should be used to check existing marker posts at traffic calming sites on the Network)

Location Sensors Embedded in the Road Surface

There is no evidence that electronic embedded tags are used on the road network in England to assist in locating traffic calming features. Their use would offer benefits over manual location markers, but they are considered to be less flexible, and of less benefit, than GPS systems. If it were decided to fit tags retrospectively, the costs could be quite high and probably unjustifiable.

Global Positioning Systems (GPS)

GPS are developing quite rapidly and being fitted more regularly on Winter Service spreaders to allow the driver to control various spreading parameters. Where GPS equipment is already fitted on vehicles, it is likely to be inexpensive and convenient to fit the supplementary equipment needed to permit global positioning capability so that operators can identify and treat the highway in the vicinity of traffic calming measures.

At present, there is no identified and justified need for GPS systems to be used solely for the location of traffic calming features. In the light of information being collected on future experience it may be advisable that Service Providers investing in winter service vehicles should leave options open for the future enhancement of existing GPS systems.

5.4.8.4 Winter Service Practice in the Vicinity of Traffic Calming Features

For precautionary treatments and/or snow clearance in the vicinity of traffic calming features'. it may be necessary to take one or more of the following actions:

- Lift snowploughs and plough snow around the traffic-calming features;
- Apply heavy salting locally to be carried (by traffic) onto the feature; and/or
- Adjust spread rates or spinners to minimise overspreading.

The second and third points above appear to be contradictory, possibly indicating the diverse nature of situations which may be encountered on the trunk road network and the judgements needed to ensure a safe and accessible Network.

The width of narrowings may influence the procurement of ploughs and the choice of which type of plough to use on a particular route.

5.4.8.5 Monitoring and Reporting

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Investigations indicate that Service Providers have not experienced particular difficulties in carrying out pre-salting and snow clearance operations in the vicinity of traffic calming features.

Where the Service Provider does experience difficulty in carrying out Winter Service as a consequence of traffic calming features it should report the circumstances to the Service Manager and make proposals for resolving the matter. When reporting and proposing solutions the following issues need to be considered:

- The nature of the traffic calming feature or features;
- The physical characteristics of the feature(s);
- Any difficulties with locating the features;
- The problems encountered;
- The effectiveness of the attempted treatment(s);
- Any resulting consequences of the difficulties, including implications for highway safety.

When monitoring and reviewing the effectiveness of existing arrangements for carrying out Winter Service in the vicinity of traffic calming features, the Service Provider should:

- Be alert to the increasing use of such measures and the use of multiple and varied calming features in any one location. These conditions may result in the emergence of new challenges which should be dealt with effectively and consistently by operatives.

Report any difficulties encountered during winter service operations to the Service Manager

5.4.8.6 Snow and Traffic Calming Areas

For very heavy accumulations of snow, snowploughing appears to present few difficulties in the presence of traffic calming features, but snow blowers should not be considered other than in the most exceptional circumstances.

Current experience and best practice in carrying out winter service in the vicinity of traffic calming features can be summarised as follows:

1. In view of the claimed lack of difficulty in completing effective winter service operations using traditional techniques, the Service Provider should not necessarily consider changes to its current practice and equipment. It is however important that operations are effective and remain so and consideration should always be given to adopting the most effective alternative techniques where current practices fail to provide the level of service required.
2. The only additional measures reported included the need to adjust speed in some areas and to take special care when ploughing near speed humps and certain types of kerb and ramp.
3. Plough blades should be carefully adjusted for all winter service operations, but especially so when ploughing is likely to take place in the vicinity of traffic calming features that protrude above the normal carriageway level or deviate from the horizontal kerb-line. Sectional spring-loaded plough edges can be used to prevent damage if a plough strikes the traffic calming feature.

5.5 Anti-icing/De-icing Materials

5.5.1 Introduction

To ensure efficient precautionary treatments those anti-icing/de-icing materials should be selected that are appropriate to the requirements of the Network. Although salt, with a nominal 6.3mm grading, is the most common anti-icing/de-icing material used on the motorway and trunk road network, other materials may be used to advantage in specific locations. The Service Provider should consider all relevant materials and select the most appropriate for each part of the Network and for each occasion, taking into account the cost of storing and spreading the material and the environmental impact. The environmental consideration should take account of the effects of both the use and the storage of anti-icing/de-icing materials. Details of the materials selected and justifications should be recorded in the Severe Weather Plan.

Following the introduction of the new pre-wet capable fleet into each area, pre-wet treatment should be used as the Service Providers' default precautionary treatment in the absence of any sound justification for using an alternative. Service Providers must provide all necessary brine production and storage facilities within each depot to serve that areas needs.

Prevention of contamination and degradation of the materials should be considered to ensure that they remain effective and do not create other hazards caused by poor storage or handling. The Service Provider should detail in the Severe Weather Plan the arrangements and regimes that are to be in place to ensure consistency of supply and compliance with good environmental practice. Records of material selection, justification and environmental impact should be retained in accordance with the form of contract.

5.5.2 Dry Salt

5.5.2.1 Introduction

The usual method of preventing the formation of hoar frost and ice on road surfaces, during freezing periods, is to spread granular rock salt before adverse conditions develop. The rock salt utilised for this purpose is usually at or close to its natural moisture content and has a dry appearance, hence the process is sometimes known as 'dry salting'.

Parmenter (1991) reported that, when mined, rock salt has a natural moisture content of about 0.5 per cent. Because rock salt is a hygroscopic material, it absorbs moisture even when stored in covered barns. The salt will absorb moisture up to a content of about four per cent, the usual moisture level at which the salt is spread on the road surface.

The level of moisture can be a critical issue affecting the value of rock salt as an anti-icing agent. This is because dry rock salt, primarily Sodium Chloride (NaCl) has no direct melting action. Melting occurs only after the salt forms a solution by absorbing moisture from the atmosphere or from the road surface to be treated

The maximum size of dry rock salt used on the Network must be 6.3mm to BS 3247:1991

5.5.2.2 Salt storage

The salt should be stored in barns or other designated areas within the Service Manager or Service Provider compounds. All salt which is not stored in barns should be covered in protective sheeting in a manner that avoids the ingress of moisture into the material as far as is practicable. Covered salt gives rise to a number of environmental and cost benefits:

- Reduces product loss from wind and water erosion

- Reduces caking and clumping of stockpiles
- Reduces the volume of runoff that has to be managed
- Improves the water quality of surface runoff

The salt should also be treated with an anti-caking agent before delivery in accordance with the current British Standard. If salt is left exposed to precipitation, anti-caking agents can be washed from the outer layer of the stockpile.

The Service Provider should monitor the moisture content and gradation of particles in the stockpile on a regular basis and record the findings.

The Service Provider should minimise salt handling as each handling can cause salt loss and particle breakdown

Bases for salt storage should be constructed to form a hard, smooth durable surface that is resistant to salt induced spalling. Surfaces formed from materials that are liable to become loose and then mix with the salt should not be used.

As salt is removed from stockpiles a safe slope on the material must be maintained to protect operatives from the risk of collapse of the stockpiles.

Exposed outdoor stockpiles must be formed into the shape of long rectangles

The Service Provider must ensure that salt stockpiles do not become contaminated with foreign matter likely to cause damage to other road users and the winter service vehicles.

Careful consideration should be given to drainage. Water should be prevented from running into stockpiles and any water running from stockpiles should be intercepted and appropriately dealt with to minimise environmental effects. Stockpiles should be located where water cannot rise through the stockpile.

The Service Provider should consider using any recycled wash water, salt laden drainage and other salt containing liquids as part of a pre-wet, or liquid brine treatment regime.

Salt must not be stored within 4.5m of hedges or within the rooting area of trees. It should be stored on impermeable foundations if within 15m of tree rooting areas.

5.5.3 Pre-wetted Salt

5.5.3.1 Introduction

Pre-wetted salt is accomplished by wetting dry salt (at its natural moisture content) at some point between the vehicle hopper and before application to the road surface. The liquid used as a pre-wetting agent can be water or a suitable chemical solution of brine using either Sodium Chloride (NaCl) or Calcium Chloride (CaCl₂). A ratio of 30% pre-wetting agent to 70% dry salt is commonly used.

It is considered that pre-wetted salt enters into solution much more effectively than dry granular salt, thus enabling the anti-icing action to begin more quickly.

One of the main advantages of pre-wetted salt is that, because it has a higher moisture content than naturally occurring rock salt, it sticks to the road more readily, even to a dry road. The anti-icing action is therefore able to begin more quickly and with greater certainty.

Pre-wetting can achieve a 25% reduction in the usage of rock salt.

5.5.3.2 Properties

Pre-wetted salt and brine are effective over a similar temperature range to rock salt but adhere to the road better than dry salt and can be spread more uniformly with less wastage. The anti-icing/de-icing action is more immediate. However brine is more readily dispersed by rain.

5.5.3.3 Storage

The salt component of pre-wetted salt is stored as dry salt with the water or brine being added at the point of application to the road surface. Brine may also be stored as dry salt (although it should be noted that salt of a high purity (>98.5% NaCl) is normally used), with a saturator in the compound producing the brine that would then be held in an appropriate tank. Alternatively brine may be obtained and delivered pre-mixed from suppliers and stored in an appropriate tank.

The most commonly used pre-wetting technique requires specialist equipment. A saturator or salt station is required to produce the brine solution (wetting agent), which is simply a semi-automated tank where the brining salt is manually added to the circulated water supply. The concentrated brine then runs into a separate vessel within the tank to be drawn off as required. A weir within the tank collects any undissolved solids and foreign matter, which is then collected and disposed of periodically. A controlled and consistent quality of brine is assured and the whole operation is relatively low cost and maintenance free.

Salting vehicles specifically designed to undertake pre-wetted salting operations are readily obtainable. In addition, hybrid vehicles have been developed that will run both dry and pre-wetted operations. Recent developments have also led to the production of combi-spreaders that spread both dry and pre-wetted salt, in addition to brine only. All vehicles require a hopper for the dry anti-icing agent and integral tanks for the storage of brine. Associated pipe work is also required to pass the brine from its tanks to the spreader. In most cases, existing salting vehicles fitted for traditional dry salting can be retrofitted with brine tanks etc. to enable them to carry out pre-wetted operations.

5.5.4 Alternative Anti-icing/De-icing Materials

5.5.4.1 Introduction

Alternative de-icing materials are usually more expensive than salt. It is anticipated that any use of an alternative anti-icing/de-icing material will be restricted to isolated, specific circumstances (e.g. structures susceptible to corrosion).

Alternative anti-icing/de-icing materials that may be considered include:

- Potassium Acetate salts in solution
- Urea

Properties of these materials are summarised in the following paragraphs and in Table 5.5.1

5.5.4.2 Potassium Acetate Salts in Solution

This material has a density of approximately 1.25 tonne/m³ and is sprayed directly onto the road surface. Application of acetate salts in solution may be either by spray bar or by a spinner. The skid resistance of a wet road is not significantly affected by a precautionary treatment.

5.5.4.3 Urea

Urea is a white, crystalline compound with a bulk density of approximately 0.74 tonne/m³. It is normally supplied as spherical pellets and applied using a purpose built spreading vehicle, with

wetting of the compound taking place immediately prior to its release onto the spinner of the spreading vehicle.

The wetting agent (a mixture of water and anti-freeze), improves spreading uniformity, increases adhesion to the road and resists the material being blown away. It increases the skid resistance of an icy road, but not as dramatically as salt, but the wetting agent can initially have an adverse effect on skid resistance.

Urea should be stored loosely or in 50 kg bags, in a dry, cool building, giving protection from the weather and free from appreciable temperature fluctuations so that condensation from the atmosphere is avoided. Bags, if used, should preferably not be stacked directly upon concrete floors and pallets should be used but should not be stacked more than two high as pressure tends to promote cracking and setting. The building should be well ventilated, to prevent the build up of ammonia fumes, particularly in summer. Forced ventilation may be necessary if all doors and windows are closed. Bulk Urea can also be stored in purpose built plastic lined timber hoppers.

Table 5.5.1 Alternative Anti-icing/De-icing Materials

Anti-icing/De-icing Material	Approx. cost (see note 1)	Treatment Spread rate	Action/ Effectiveness	Environmental Effects	Health & Safety
Potassium Acetate (Solution)	X12	10-40g/m ²	Immediate action Effective for up to 48 hours to - 15°C in suitable weather conditions	Effectively non-corrosive compared to salt Safe to aquatic life	Gloves and eye Protection Solutions are safe To handle
Urea	X100	20-50g/m ²	Requires agitation By traffic Effectiveness: 10% solution to - 3°C 25% solution to approx - -7°C Little worthwhile effect below -7°C and ineffective below -11.5°C Remains effective for up to 12 hours in fair weather but repeat applications need to be more frequent in rain or strong winds	Non-aggressive, but very soluble in water, and may produce ammonia and carbon dioxide. Ammonia is toxic to aquatic life. Ammonia further decomposes to nitrate which, promotes growth of vegetation, and creates an oxygen demand that may cause further harm to life. Urea solutions may be detrimental to steel, plastics and concrete in some circumstances. Vehicles should not be left full of urea for any length of time, and thoroughly washed down after use.	Ventilation, due to ammonia required Safe to handle but the pellets break into powder easily which becomes very slippery due to its high hygroscopic nature. Face masks and eye protection are recommended When heated to melting (i.e. fires) Urea decomposes to form toxic substances. Only trained fire fighters, properly equipped with breathing apparatus should attempt to deal with fires in Urea stores. Local Fire Fighting Services should be informed of Urea stock sites.

5.6 Techniques for Precautionary Treatments

5.6.1 Introduction

The effectiveness of precautionary treatments can be significantly affected by how the treatment is applied. The following advice covers the operational techniques for winter service using the appropriate anti-icing/de-icing material for each part of the Network. Materials other than rock salt are available but their use may require different techniques. The treatments should be applied in accordance with the procedures described in the Severe Weather Plan so as to avoid harm to users and damage to users' vehicles.

Routes used by spreading vehicles should be in accordance with Chapter 5.4. The Service Provider should aim to apply treatment as close, as is practicable, to the forecast time of freezing, in particular avoiding applying treatments during the early evening to protect against a forecast of ice forming in the early hours of the following morning.

5.6.2 Salting

To prevent the formation of ice or frost (or to melt existing snow) the salt must first form a solution. Therefore, after spreading rock salt there is a time lag during which the salt forms a solution and becomes effective. Target spread rates of salt are given in Table 5.6.1.

In conditions where low relative humidity is accompanied by low road surface temperatures, the quantity of dry salt required to melt ice can become excessive. Salt is also relatively slow at entering into solution. Other chemicals, such as Calcium Chloride (CaCl_2), dissolve much more readily and therefore become more effective as an anti-icing agent.

To be most effective, salt should be spread before ice forms or snow settles on the road. Anticipating these conditions, and reacting correctly, depends on a mixture of local knowledge and experience, good weather forecasts, and an awareness of the current condition of the road. It is recommended that the Service Provider makes full use of specialised road weather forecasting services and the Road Weather Information System.

The success or otherwise of the operation depends to a large extent on the good judgement of those who decide whether or not to treat. Local geographical idiosyncrasies or other factors may have to be considered in reaching a decision.

Table 5.6.1 Target spread rates for anti-icing/de-icing salt

Location	Spread Rate
Carriageways Frost forecast:	Salt stored under cover 10g/m ² Salt stored in the open 15-20g/m ²
Prior to snowfall or rain followed by freezing	20g/m ² to 40g/m ²
Hard shoulder or carriageway marginal strips	50% of selected treatment
Porous surfacing	Plus 25% of selected treatment
Footways, cycle tracks and pedestrian areas	25g/m ²

A good rapport with the weather forecasting organisation is essential if forecasts are to be used to best effect. Various services are now available which provide Winter Service personnel with the kind of forecasts that help to facilitate a good winter service. Chapter 5.3 provides further advice on weather forecasts and the Road Weather Information System.

A decision to treat will depend upon many factors but if road surface temperatures are predicted to fall below plus 1°C a precautionary treatment should normally take place unless:

- no moisture is on or is expected to be on the road; or
- there is sufficient residual salt on the road to deal with the expected conditions.

However attention is drawn to 5.6.3, below, which highlights the effect of low temperature combined with low humidity conditions.

Road inspections or the Road Weather Information System will help to give an indication of residual levels of anti-icing/de-icing materials and other information about the road surface condition. Elevated sections of roads, including bridges, and sections lying in low ground, or where the topography channels wind borne cold air, are more prone to freezing and may need special attention.

For forecasts of significant accumulations of snow it is essential that sufficient treatment is applied before the snow starts to stick to the road as the treatment will melt the initial snowfall and provide a wet surface beneath subsequent snow making the work of snowploughs much easier.

Effectiveness of Salt after Rain

On a well-drained road during and after rain the thickness of the water film typically varies between 0.08mm and 0.50mm. Once rain has ceased to fall, traffic quickly reduces the water film thickness. Thin films of ice formed by the freezing of water on road surfaces are usually less than 0.25mm thick. Table 5.6.2 gives guidance on the effectiveness of precautionary salt treatments in preventing freezing of the water film and shows the effect of a treatment of 10g/m² on the freezing point of the water/salt solution.

Table 5.6.2 Effect of 10g/m² Precautionary Treatment on Freezing Point

WATER FILM THICKNESS (mm)	FREEZING POINT
0.25	-2.4 °C
0.30	-2.0 °C
0.50	-1.2 °C

Assuming that the water film thickness will generally not be greater than 0.25mm when precautionary treatment is being considered, a spread rate of 10g/m² will thus prevent the formation of ice unless temperatures fall below minus 2.4^o C. Should lower temperatures be anticipated however, a rate of spread of 20g/m² will prevent freezing down to minus 5^o C.

5.6.3. Low Temperature combined with Low Humidity Conditions

5.6.3.1 Introduction

When low temperatures combined with low humidity conditions occur, traditional anti-icing treatments in the form of spreading dry salt can be of limited effectiveness in preventing the formation of ice. Greater diligence and control are therefore often necessary to ensure that the highway is maintained in a safe condition.

Recent research has identified possible measures to maximise the effectiveness of treatments. However, the advice given must be considered within an appropriate comprehensive assessment of conditions and possible treatments.

Low humidity combined with low temperature conditions are most likely to occur in December and January at about the time of the winter solstice. The conditions have, however, been reported

throughout the normal winter operational period and the Service Provider should always be alert to the possibility of them occurring.

It appears that low humidity and low temperature conditions are more likely to occur when the general weather pattern is dominated by cold and relatively dry air masses, usually coming from northerly or easterly directions. These general weather features can be accompanied by winds between 15 and 30 mph. Whilst these features have been observed to be associated with low humidity conditions they are not regarded as the only ones. Therefore, the Service Provider should be alert whatever the general weather patterns.

Slippery road surfaces can also arise due to the formation of hoarfrost. This occurs when air with a dew-point below freezing is brought to saturation by cooling. This leads to the condensation of water vapour directly as ice on the road surface. It appears that in these conditions sufficient water vapour may be available for the formation of hoarfrost, but not necessarily to enable the anti-icing salt to go fully into solution. The phenomenon may also be due to temperature differences between the rock salt and the road surface.

Precise reasons for the formation of ice on a road surface despite the presence of an anti-icing treatment are not necessarily clear, but there are general factors that may often contribute to the situation. These include:

- Dry road surface;
- No precipitation;
- Road surface temperature $\leq 0^{\circ}\text{C}$;
- Road surface temperature \leq Dew point temperature;
- Relative humidity < 80 per cent;
- Closeness to winter solstice (21st December).

It has also been observed that low traffic flows and high winds may also be significant in reducing the effectiveness of an anti-icing treatment.

The Service Provider must take careful note of the information supplied by its road weather forecasting organisation. These include forecasts of temperature and levels of humidity. Where the forecasts suggest that a combination of low temperature and low humidity are expected, steps must be taken to ensure that an effective treatment regime is adopted which keeps the road free of ice.

5.6.3.2 Rock Salt Moisture Absorption

Below an atmospheric relative humidity level of about 80 per cent, the absorption of moisture by rock salt decreases rapidly and, at low levels of relative humidity, salt particles remain inert and ineffective.

The size of the salt grain can have a significant effect on the rate at which it passes into solution, especially when the available moisture to assist the dissolving process is limited, as in low humidity conditions. This fact can be important on relatively lightly-trafficked roads in that the larger grains may not be broken up by the action of traffic and will therefore take some time to enter into solution. On heavily-trafficked roads the action of tyres should ensure that the larger grains are crushed and spread so that the melting action will be assisted.

Recent studies (Burtwell and Lawrence, 1998; Burtwell, 2000) have shown that, by using a smaller particle size specification for rock salt, the time taken for a solution to form can be reduced. This can be explained by the fact that salt requires a finite amount of water in which to dissolve. The volumetric proportions of a 6.3mm particle would mean that much less moisture would need to be

absorbed to complete the process than for a 10mm-sized particle. It has been illustrated (OECD, 1989) that at -5°C it takes a 2mm grain three times longer to enter solution as a 1mm grain, and at -10°C it takes about five times as long.

Dampening the material with water or other wetting agent prior to spreading can accelerate the process of dissolving salt particles. In recent tests it was found that, by increasing the moisture content from about four per cent to 5.5 per cent, a significantly shorter time was required for a solution to be formed. It appears therefore that increased moisture content assists the dissolving process.

In terms of suitability, it may be prudent to consider the following hierarchy of treatments when low temperature combined with low humidity conditions occurs. It should be noted however that there could be substantial differences in the performance of the various options. The Service Provider should not automatically assume that a treatment lower in the list is an acceptable alternative to one higher in the list (e.g. 6.3mm dry salt is not automatically an alternative for 6.3mm dry salt with any added water). Where doubt exists, the Service Provider should check that the treatment is effective in the prevailing conditions at that time. Treatments in order of expected effectiveness are:

- Full pre-wetted salt using a proprietary pre-wetting system;
- 6.3mm dry salt with added water in the stockpile;
- 6.3mm dry salt with added water in the hopper;
- 6.3mm dry salt

5.6.3.3 Treatment Options

It is essential for the Service Provider to take appropriate steps to ensure that, in all foreseeable situations, there is reasonable certainty that the treatment adopted will be fully effective in preventing ice forming and snow adhering to the road surface.

In order to ensure that a treatment is effective, the anti-icing agent must adhere to the road surface and enter into solution before ice is forecast to form on the road surface. Under low temperature and low humidity conditions, these requirements become increasingly difficult to meet, especially when these conditions are extreme.

If a substantially dry rock salt is spread in these conditions, there is considerable risk that it will not adhere to the road surface or it will not enter into solution. Much of it will probably be blown off the road surface by wind or by vehicle-generated turbulence. It is therefore important to ensure that the anti-icing agent is wetted so that it will adhere to the road surface and be able to enter into solution even in the event that moisture is not available from the road surface or the atmosphere.

The simplest form of wetting of the anti-icing agent could be achieved by simply adding water to the stockpile or vehicle hopper before the spreader begins its salting run. A second stockpile of salt, specifically for use in low humidity conditions, could be located at the depot. This stockpile could be wetted to the desired moisture content as required. The amount of water added should be designed to raise the overall moisture content of the salt load to about six per cent and be well distributed throughout the stockpile or hopper. Before adding water, the Service Provider should know the total weight and moisture content of the salt in the vehicle hopper and then add sufficient water to raise the overall moisture content to the desired level. In broad terms, 10 litres (approx.) of wetting agent should raise the moisture content of one tonne of salt by about one per cent.

Adding water to the hopper of the spreading vehicle is not generally a recommended practice for pre-wetting salt because uniform dispersal within the load is difficult to achieve and 'clumping' of the salt particles may occur in the chute feeding the spinner. However, the technique may be considered as a short-term measure where specialist pre-wetting is not available. Ideally, when

faced with low temperature and low humidity conditions, the Service Provider should consider the use of pre-wetted salting treatments.

5.6.3.4 Decision Considerations

It is recognised that a full understanding of low temperature and low humidity weather conditions is still being developed. The Service Provider must nevertheless recognise that these conditions do occur and that they appear to be doing so more frequently. It is therefore essential that the Service Provider develops effective arrangements for treating roads when these conditions occur.

Current knowledge suggests that when temperatures are about or below freezing and humidity is below about 80 per cent the effectiveness of traditional UK anti-icing treatments, such as rock salt, is reduced significantly. In such conditions, the Service Provider should follow the guidance given in this manual.

Careful monitoring of weather forecasts is necessary to establish the likelihood of the conditions developing and also changes in condition that may result in particularly high risks of ice forming. Low temperature and low humidity followed by rain can result in conditions becoming more severe. The Service Provider should ensure that it has access to equipment that can provide effective treatment in low temperature and low humidity conditions. It may in the simplest form be the ability to wet a load of normal rock salt so that it will adhere to the road and enter into solution. However the weaknesses of this technique have been identified above.

Carrying out effective and timely treatment is necessary to ensure that the likelihood of the anti-icing agent becoming fully effective is maximised.

Monitoring the condition of the Network following treatment should be carried out to confirm that the treatment has been effective. If it has not been fully effective, contingency treatments should be considered which will achieve the required condition. It should be noted that both active and passive road weather sensor systems require the presence of moisture to determine either the concentration of an anti-icing chemical on the road or the freezing point temperature of the solution present on the road sensor.

Liaison with the media and Police should be considered, in order that appropriate warnings to the travelling public can be broadcast in the event of conditions becoming particularly difficult.

5.6.4 Thin Surface Courses

Carriageways with thin surface courses (TSC) require careful consideration. Many of the modern (TSC) materials are characterised by having 'negative texture' whereby a considerable number of voids are present within the finished surface. During the application of anti-icer/de-icer, the residue solution is often trapped in the voids and is withdrawn onto the surface by the action of tyres over the surface. If this occurs regularly on a heavily-trafficked carriageway, a reasonable degree of residual de-icer will remain on the surface of the carriageway to combat the formation of ice. On lightly-trafficked carriageways, however, the de-icer is retained in the voids. These effects are most pronounced on newly laid surfaces when the porosity is highest.

Operational experience has indicated that TSC does not benefit from an increase in dosage above that required for hot rolled asphalt but that the effect of residual salt on the carriageway is reduced, particularly in areas of low traffic, and as such treatment can be required more frequently. Treatment of TSC should be treated with caution; residual material should not be relied upon to provide protection; and if there is any hint of moisture being present, the Service Provider should take a pessimistic view of the forecast.

5.6.5 Porous Asphalt Road Surfaces

5.6.5.1 Introduction

Under certain winter conditions porous asphalt requires more attention than comparable conventional road surfaces. This is due to different characteristics in respect of surface temperature, humidity and the ability to retain salt on the surface. In general, more anti-icer/de-icer is required for treatment of a porous asphalt road surface than for a dense surfacing material.

At high traffic intensities the behaviour of roads surfaced with porous asphalt barely differs from that of dense road surfaces. At low traffic intensities however, the loss of thawing agent into the voids of porous asphalt results in a greater likelihood of freezing in the event of only a small amount of precipitation (condensation, freezing fog) and greater quantities of thawing agent being required to treat heavy precipitation.

Inadequate super elevation or gradient can also be more critical on porous asphalt roads. Precipitation may collect in the voids of the material and be retained at certain locations. The road surface thus remains damp and more likely to freeze in these locations. This action is exacerbated by the differing response of porous asphalt to temperature change. The temperature of a porous asphalt surface falls below freezing point more quickly than a dense road surface and rises above freezing more slowly.

Prompt snowploughing is recommended on porous asphalt road surfaces, but care is required to avoid damaging the surface. Ploughs should be fitted with rubber skirts on the blades.

The following paragraphs contain more detailed information on the performance and treatment of porous asphalt in winter conditions.

5.6.5.2 Treatment of Porous Asphalt Road Surfaces

In winter conditions porous asphalt requires closer monitoring, particularly in the following situations:

- Roads with low traffic flow
- Roads on an incline
- Roads with a limited super elevation
- Hard shoulders
- In the event of changes from cold to warm temperatures
- In the event of snow remaining on the road surface
- In the event of slipperiness caused by condensation
- In the event of slipperiness caused by freezing fog and
- At changeovers from porous asphalt to dense road surfaces.

5.6.5.3 Behaviour of Porous Asphalt with Temperature Change

As temperatures fall, the temperature of porous asphalt road surfaces falls below freezing point an average of half an hour earlier than that of dense road surfaces. As temperatures rise, the temperature of porous asphalt road surfaces rises above freezing point an average of an hour later than that of dense road surfaces. The temperature of porous asphalt road surfaces remains below freezing point about 5% longer than that of dense road surfaces.

In extreme weather conditions (little wind, clear sky), the surface temperature of roads surfaced with porous asphalt is about 1°C lower than that of comparable roads with dense road surfacing materials. The behaviour of porous asphalt as temperature changes can be explained by the relatively high insulation value of the road surface due to the high proportion of voids. As a result, heat is less easily transported from the warmer sub-grade to the surface in the event of frost from above. The voids also provide a greater surface contact area with the cold air. This greater heat/cold exchange also contributes to the lower temperature of porous asphalt in comparison with a dense road surface.

In view of the foregoing temperature characteristics, it is recommended that a thermal mapping survey should be carried out on new porous asphalt surfaces. The thermal mapping survey will assist with the re-siting of existing ice detection sensors and indicate the most favourable siting of new sensors to provide an accurate temperature profile of the road. Siting of at least one sensor on all porous asphalt sections is considered to be essential.

5.6.5.4 Behaviour of Porous Asphalt with Humidity

The voids in porous asphalt ensure that precipitation is slowly removed to the shoulder as a result of the super elevation of the road. However, some of the precipitation remains behind in the pores. In summer the remnants quickly evaporate after a wet period, whereas in winter the road dries more slowly. In the case of roads with minimal super elevation in flat areas or that have a large number of traffic lanes, moisture remains on part of the porous asphalt surface for a longer period. As a result of this residual moisture, road surfaces of porous asphalt remain damp. As a consequence roads constructed of porous asphalt will require extra attention when road surface temperatures fall below freezing following a period of precipitation.

If the road surface temperature falls below freezing point after a period of precipitation, roads constructed of porous asphalt will require extra attention on account of the moisture present.

5.6.5.5 Behaviour of Porous Asphalt with Anti-icer/De-icer Treatment

Much of the de-icing agent spread on roads made of porous asphalt disappears into the voids, and only a small proportion remains on the surface. However, because of the 'air pumping action' effect of vehicle tyres, traffic will ensure that the thawing agent in the pores is brought back to the surface of the road.

Consequently some of the anti-icer/de-icer retained within the voids will continue to contribute to the de-icing process. This process will be disrupted if the traffic intensity is low (e.g. at night) and even a small quantity of moisture falling on the road during these conditions (e.g. condensation, freezing fog), can result in porous asphalt road surfaces behaving differently from conventional surfaces. As a result of the extra moisture absorbed by the pores in porous asphalt surfaces, a larger quantity of anti-icer/de-icer is required.

On roads with dense road surfacing, traffic readily leads to horizontal transport of the de-icing agent (i.e. in the direction of the traffic). With porous asphalt this horizontal movement of the de-icing agent is considerably less. As previously stated, traffic also creates a vertical movement of the agent on such roads. This means that the anti-icer/de-icer spread on porous asphalt roads is mixed with the moisture within the pores. In time a balance arises in which the anti-icer/de-icer is distributed as a solution through the pores and over the surface as a whole. This solution is transported vertically and to some extent horizontally by the traffic. Because the moisture in porous asphalt drains away to the shoulder slowly, the anti-icer/de-icer solution remains active for a longer period..

Where a stretch of road with a porous asphalt surface is followed by one of dense road surfacing, extra attention to the initial section of the dense road surfacing is required. Since the horizontal

transport of anti-icer/de-icer on porous asphalt road surfaces is limited compared to that on dense road surfaces, there is a significant reduction in the amount of thawing agent in the initial section of dense road surfacing.

Traffic and dry conditions ensure that the de-icing agent on a road with dense surfacing will gradually disappear even without precipitation. On a road with a porous asphalt surface some of the salt crystallises in the pores under dry conditions. This slow crystallisation ensures good adhesion to the asphalt, and as a result the salt remains active. If treatment takes place several times in a dry period, for example to treat a slippery surface as a result of freezing fog or condensation, without the de-icing agent being removed to the shoulder by traffic action, a salt buffer will be formed in the pores of porous asphalt. If, following a dry period, precipitation occurs when the road surface temperature is below freezing point, the salt buffer which has collected in porous asphalt becomes active again under the influence of the traffic.

5.6.6 Freezing Rain

5.6.6.1 Introduction

The prediction of freezing rain is difficult and the action necessary to deal with it is problematic but Service Providers must consider and plan actions to be taken when such conditions occur. All details of actions intended for dealing with freezing rain must be documented in the Severe Weather Plan.

Considering the limits in the effectiveness of treatments in dealing with freezing rain it is essential that all practical measures are implemented to provide warning to road users of the hazardous conditions.

Measures for dealing with freezing rain fall into three main areas: advance planning, operational arrangements and hazard mitigation.

5.6.6.2 Advance Planning

Advance planning includes consideration of the potential impact of freezing rain and development of contingency arrangements to mitigate the effects. These contingency arrangements should be detailed in the Severe Weather Plan. Other aspects of advance planning include training and exercises. Specific measures that should be considered include:

1. Prior to the commencement of the winter season, agreement should be reached with the police and the Regional Control Centre (RCCs) on procedures for dealing with occurrences of freezing rain and any incidents that may occur during or following such conditions.
2. Outline operational arrangements should be developed and documented within the Severe Weather Plan. Although the adverse effects of freezing rain can impact across any part of the network particular consideration should be given to those parts where the impact may be more significant such as on gradients or difficult alignments.

5.6.6.3 Operational Arrangements

Operational arrangements should include details of treatment regimes. In general freezing rain should be treated in a similar manner to snow, i.e. treatment in advance of and during the event and then treatment following as required.

Specific measures that should be considered by the Service Provider include:

1. If the condition of freezing rain is anticipated contact with the police, RCC, adjoining service providers and local authorities is to be made to inform them of the proposed action.
2. Prior to the arrival of the freezing rain a pre-treatment is to be made in the same manner as would be made prior to snow falling.
3. Constant monitoring of the situation is to be made and an additional treatment is to be carried out immediately the rain commences and continued until such time that the rain has ceased or the temperature of the road has risen above freezing
4. Freezing rain usually occurs along the line of an incoming warm front. If possible, to ensure maximum effectiveness of the salt, the advance treatment should be made in the same direction and immediately in advance of the weather front. Use should be made of weather radar where available to help determine the time of treatment. Consideration should be given to positioning vehicles on the point of the route where the weather front will first hit in order that timely treatments can be undertaken
5. Some salt will inevitably be lost during and following treatment and therefore careful consideration needs to be given to the requirement for continued successive treatments.

5.6.6.4 Hazard Mitigation

The nature of freezing rain means that treatments will have virtually no effect initially and ice will form on the carriageway. Mitigation of the hazard is therefore a significant aspect of the actions taken in response to freezing rain. The main action is to inform road users of the hazard but more proactive measures might be required. For example consideration should be given to closing the road as the rain arrives and holding the traffic (rather than diverting) until such times as it deemed safe to proceed. Such considerations will need to be made on a local basis taking into account local circumstances.

Specific measures that should be considered by the Service Provider include:

- Where available fixed or mobile Variable Message Signs should be used to warn road users of the hazard. The existing established procedures for requesting VMS settings to be made should be followed well in advance. The following legend is currently the most appropriate to use – ‘SKID RISK SLOW DOWN’
- National Incident Liaison Officer (NILO) and/or the Highways Agency Press Officer should be contacted in order that the local media can be advised as necessary
- Where available use of variable mandatory speed limits should be considered. This will require arrangements and protocols to be established with the appropriate Police Control office or RCC as part of the advance planning procedures.
- Consideration should be given to the use of rolling blocks and convoy arrangements to either hold or slow traffic down both just prior and during the event. This will require arrangements and protocols to be established with the appropriate police authorities or RCC as part of the advance planning procedures.

5.7 Techniques for Treatment of Snow and Ice

5.7.1. Introduction

The effectiveness of treatments of snow and ice on the paved areas can be significantly affected by the method of application of the treatment. The following advice covers the operational techniques for providing that part of the winter service associated with the removal of snow and ice from paved areas. The techniques include ploughing, blowing, the use of snow fences and snow gates together with changes to the methods of application of anti-icing/de-icing materials when snow or ice is already present on the paved area.

During snow clearance operations, any build-up of snow across rail, bridges, gateways and along fences should be promptly removed and measures taken to avoid further build up. Throughout any operation to remove snow and ice, periodic situation reports should be provided for the Service Manager and road users.

5.7.2 Safety of Operatives and Other Road Users

Winter Service operatives should wear high visibility clothing incorporating retro-reflective markings at all times when out of a vehicle.

U-turns on APTRs must only be carried out when there is no risk to spreading or snowploughing vehicle drivers or to other road users and where it is legal to do so.

5.7.3 Treatment of Settled Snow/Ice

The density of fresh untrafficked snow is about one-tenth of that of ice and the action of traffic assists in the process of melting and dispersal. Approximately 6g/m² of salt is required for 10mm of fresh snow for each degree Celsius that the air temperature is below freezing point. (N.B. The temperature is normally higher than minus 3⁰ C when falls of snow of 10mm or more occur).

If ice has formed salt should be spread at up to 40g/m², depending on the amount of ice present and the temperature, to ensure a rapid melt. Particular attention should be paid to lengths of road that are known to be susceptible to 'run-off' water from verges or central reserves. Although the road itself may be dry, accumulations of snow may melt, run onto the road and then re-freeze.

Snow ploughs with soft edges can plough to 0mm although there is a risk of possible damage to the carriageway surface and roadside furniture. Each pass of the plough should be supplemented by salt spread at 20g/m² to prevent the compaction of any remaining snow and to aid dispersal by traffic and subsequent ploughing. The Service Provider should commence snow ploughing operations early enough to ensure that snow accumulations do not exceed 10mm in any lane.

It is important to continually monitor the air temperature during clearing and, as the temperature drops, spread rates should be increased, up to 40g/m² if necessary. Although current vehicle mounted infrared thermometers offer reasonably high accuracy levels Road Weather Information Systems or thermometers at suitable open sites in compounds, or similar systems are generally preferred.

Even light snowfalls may call for ploughing where local drifting has occurred, or where snow has not been dispersed by traffic. This may occur where the traffic is reluctant to use lanes 2 or 3, or at night when traffic flows are light. During prolonged falls of snow, ploughing should be continuous to prevent build-up and should be supplemented by simultaneous de-icing at a rate of between 20g/m² and 40g/m².

If snow depths reach 120mm, or when tackling drifts, or when working on gradients, it may be preferable to plough without spreading, since the weight of the treatment load will aid vehicle

traction. When conditions permit, spreading should be resumed. Use of a snow blower may also be considered for the removal of deep snow.

Ploughing or snowblowing is not practical in built up areas. Repeated applications of de-icer can remove heavy accumulations, but this type of treatment is not recommended as it is likely to provide an unacceptable surface for traffic. In such situations, consideration should be given to the use of a snow blower with the snow being directed into an accompanying lorry, followed as soon as possible by salt spreading at 20g/m².

The formation of hard packed snow and ice should be a rare occurrence if the performance requirements are achieved. If it does occur, provided it is no more than 20mm thick and the air temperature is above minus 5°C, removal is possible by using successive treatments of salt at rates of spread between 20g/m² and 40g/m².

Great care must be taken as the use of de-icing agents on snow or ice can produce an uneven and slippery surface. If there is any danger that the surface will become unacceptably slippery as a result of using de-icing agents, then the addition of abrasives should be considered. Application of the initial treatment technique should be resumed as soon as possible since abrasives contribute little to the removal of snow/ice and may block drains and gullies upon thawing. Abrasives should not be used on structures where there is any danger of blockage to drains. The principal treatments for settled snow/ice are summarised in Table 5.7.1.

Table 5.7.1 Principal Treatments of Settled Snow/Ice

ROAD SURFACE CONDITION	TREATMENT	
	SALT SPREAD	PLOUGHING
Ice formed	20-40g/m ² for rapid melting	Not possible
Moderate snow	20g/m ² to supplement ploughing, up to 40g/m ² if temperatures are falling	Required
Prolonged snowfall	20-40g/m ² to supplement ploughing	Continuous (without salting if necessary to aid traction).
Hard packed snow/ice	Successive treatments at 20-40g/m ² (supplemented by abrasives if necessary)	Not possible

5.7.4 Principal Treatments of Settled Snow/Ice

5.7.4.1 Treatment in Sustained Low Temperatures

For each degree drop below minus 5 °C, the amount of salt required to maintain the equivalent de-icing effect increases by about 14g/m². However where traffic is reasonably heavy, little or no increase is necessary until sustained temperatures fall below minus 10 °C. When sustained temperatures do fall below minus 10 °C, one method that has proved to be effective is the addition of calcium chloride mixed with 4 parts of salt. It should be noted however that calcium chloride is expensive and difficult to store as it absorbs moisture freely.

5.7.4.2 Spreading Techniques

To be effective, anti-icing/de-icing agents should be spread evenly and at rates that suit the prevailing or expected conditions. Care should be taken to ensure that spread widths are neither too wide nor too narrow. The treatment should be carried out using automatic machines, the controls of which should be calibrated and clearly marked for distinct rates of spread, up to a maximum of 40g/m². Higher spread rates are unnecessary, wasteful and environmentally harmful and should be avoided.

Cross-winds can affect the distance over which treatment is spread and to compensate it may be necessary to spread from a lane upwind (if appropriate) from that normally chosen. In exceptionally strong winds it may be necessary to undertake a second treatment run with the spreader set asymmetrically into the wind.

Due consideration should be given to traffic conditions and the timing of winter service operations. Wherever possible without detriment to the effectiveness of treatment, precautionary treatment should be undertaken in off-peak periods when disruption to traffic and to proper distribution of the anti-icing/de-icing agents will be minimised. If precautionary treatment in heavy traffic is unavoidable it may be necessary to seek assistance from the police, Traffic Officer Service and RCC (including motorway matrix signals and variable message signs) or to consider treatment in two runs (to ensure proper distribution of the anti-icing/de-icing agents).

Care should be taken at road works so that, in addition to areas currently being trafficked, all other areas likely to be opened to traffic are treated. Traffic management equipment, including cones and cylinders, may disrupt distribution of anti-icing/de-icing agents. Contra-flow systems should be treated in both directions.

Treatment of any special features should be identified in the Severe Weather Plan and procedures instigated to ensure compliance with agreed methods of treatment.

5.7.4.3 Snowploughing

The technique used for multi-lane carriageways should be '**clearance by lane**'.

Due to differences in local weather conditions, snow depth, snow wetness and road topography, it is difficult to be precise about the order of lane clearance. Also, local traffic densities and movements vary from day to day and even throughout a day, and may affect lane clearance priorities. In prolonged, heavy snowfall the priority will be to maintain lanes open in accordance with the requirements of the Routine & Winter Service Code. In the majority of cases this will be the more heavily trafficked left hand lane (lane 1) and the first operation will be to plough snow from lane 1 to the hard shoulder, with clearance of other lanes continuing as conditions improve.

An alternative technique for a 3 lane carriageway with hard shoulders, particularly suited to echelon ploughing (2 or more vehicles moving in the same direction, one behind the other, in different lanes), is clearance in the following sequence:

- First: plough lane 2 snow to lane 1
- Second: plough lane 1 to hard shoulder
- Third: plough lane 3 snow to central reserve
- Fourth: plough hard shoulder snow to verge.

More than 2 lanes ploughed onto the central reserve could be hazardous to traffic by inviting drifting and melt water problems later. When clearing 4 or more lane carriageways consideration

should be given to abandoning the outermost lane(s) rather than creating problems of excess snow on the central reserve.

Irregular windrows caused by ploughing passes, especially those that weave from one lane to another, are dangerous, as they may tempt drivers to overtake by squeezing into the partly cleared lane. Lanes should be completely cleared, and the windrows of snow remaining should form a smooth and continuous line without sudden encroachments into the cleared path. On motorways, windrows can be left on hard shoulders, but there should be intermittent clearings to provide refuge for broken down or abandoned vehicles, and these should be cleared as soon as lanes 1, 2, and 3 are cleared and should not be left indefinitely.

Under no circumstances should windrows be created across off and on slip roads where they diverge/converge with the main carriageway

Speeds of ploughing vehicles should be regulated, particularly at features such as underbridges, where snow could be thrown over the bridge parapet, and adjacent to the central reserve, where snow could be pushed into the opposing carriageway.

The objective is to clear all lanes and hard shoulders as soon as conditions permit. Clearance work should therefore proceed continuously, since a pause during a snowfall could lead to a build-up, which would take a disproportionately long time to clear. Packed snow, glazed by the wind, can be particularly difficult to remove.

Where clearing single carriageway roads, particularly those which have more than two lanes, snow clearing operations should be carried out so as to avoid any build up of snow in the centre of the road.

When ploughing, motorway warning signals can be displayed, so RCC co-operation is essential. It is not always possible to keep these signals free of snow, but every effort should be made to advise motorists of the snowploughing vehicles ahead.

Special consideration needs to be given to ploughing in areas of contra-flow or other temporary traffic management where normal techniques and equipment may not be suitable.

Snowplough heights

The ploughs provided by the Highways Agency are designed to operate at zero height setting. The Service Provider must ensure that plough heights are set in accordance with the manufacturers recommendations.

Care must be taken to avoid damage to road surfaces, road studs, roadside furniture and structures. At road works, traffic management equipment must not be disrupted. An accumulation of ploughed snow creating a ramp adjacent to safety barriers should be avoided.

5.7.4.4 Snow Blowing

Heavy snowfall, drifting and ploughing operations may result in a build up of snow in the carriageway and hard shoulders. Snow blowers are particularly suited to the clearance of blockages and to the removal of accumulations from the hard shoulder and carriageway where snow may be safely directed onto the verge (or possibly a wide central reservation).

5.7.5 Snow Clearance Adjacent to Solid Vertical Barriers

5.7.5.1 Introduction

The presence of solid vertical barriers (SVBs) can present operational difficulties to snow ploughing operations which will potentially result in snow being stacked on lanes adjacent to them. The following advice on snow clearance techniques to facilitate removal of stacked snow at the earliest opportunity should be used by Service Providers to produce their own strategy for dealing with snow clearance adjacent to SVBs on their Network.

5.7.5.2 Guidance

The Service Provider should consider whether any lanes may need to be abandoned during heavy snow fall due to the build-up of snow when ploughing/clearing adjacent to SVBs.

When conditions dictate it is recognised that it may be necessary to plough snow from lane 2 to the right and sacrifice one or more running lanes to stack snow whilst keeping the maximum number of lanes available to traffic and maintaining access and egress. The Routine & Winter Service Code gives guidance on the number of lanes that should be free from ice and free from snow, as far as is reasonably practicable, during snow fall for each route classification. This information should, where appropriate, be used to assist in developing a clearance strategy.

Suitable advance warnings must be posted to inform motorists if lanes are not available for use. Variable Message Signs or Mobile Variable Message Signs should be utilised.

Care should be taken when considering stockpiling snow adjacent to SVBs as it may create a hazard from which vehicles could cross the SVB. There is also the risk of melt water running across the carriageway with the possibility of it re-freezing.

Following normal snow clearing efforts carried out during snow fall, echelon ploughing to the left whilst spreading salt is an option to clear snow from those lanes sacrificed at cessation of snowfall providing sufficient resources can be made available. This will provide, when combined with a rolling road block, a relatively rapid method of removing the stored snow. Service Providers should consider the training of operatives in echelon ploughing.

A phased approach may be required for 4 or more lane carriageways. Resources may need to be diverted from other areas of the Network where clearance work is complete or considered a lower priority in order to undertake such echelon ploughing.

Consideration should be given to creating a clearance 'team' which would clear each section of carriageway with SVBs in turn (although it is recognised that this will not be practical for every area).

Assistance must be sought from Traffic Officers or the Police to provide a rolling block when clearing snow from lanes which have been abandoned during heavy snow fall.

Consideration should be given to using either permanent Variable Message Signs (VMS) if available or to site mobile VMS in advance of the clearance operation.

In many cases the hard shoulder will need to be cleared more than once to allow for snow being cleared from the offside lanes.

Bulk clearance for example by a snow blower may be required where there are SVBs to the nearside and offside or when there is a large amount of snow to remove.

5.7.5.3 Schedule and Clearance Plans for Solid Vertical Barriers

Service Providers must produce a schedule identifying the locations of SVBs on their network. The schedule must be included in the Severe Weather Plan, and should include the following details:

- a network map with each SVB location highlighted
- details of the location in relation to marker posts for motorways or relevant landmarks on an APTR
- the cross sectional position of the barrier (e.g. verge or central reserve)
- the set back of the barrier from the adjacent running lane
- construction of the adjacent verge (grass, hardened, filter drain, v-channel etc)
- number of running lanes
- details of the hard shoulder (e.g. width and construction)
- presence of slip roads diverging or merging
- presence of large areas of hatching, e.g. at diverge or merge tapers
- list of resources required for echelon ploughing including any plant required for bulk clearance
- mobile VMS available for use or locations of permanent VMS
- additional non-dedicated vehicles required to assist with clearance
- details of assistance required from outside parties such as Traffic Officer Service (TOS), Police, RCC etc

Service Providers must produce a clearance plan including a route drawing for each discreet area of SVB. These should be produced in a similar way to a gritting route plan and must be incorporated into the Service Provider's Severe Weather Plan. Each clearance plan, which may be included as part of area route plans, will include specific details for that location abstracted from the schedule along with:

- the techniques to be employed throughout a snow event on that length of road
- details of any lanes that may be abandoned during heavy snow fall
- the optimum time of day for final clearance after the cessation of snow fall (When deciding this time the guidance contained in R&WSC, if appropriate, for the route classification must be taken into consideration along with the traffic flows for that location)
- plant and personnel to be identified for both ploughing and clearance
- locations where additional resources will be sourced
- identify the role of each vehicle in the procession for echelon ploughing (plough only or plough & spreader etc)
- practicalities of having a clearance team for the area
- rendezvous points to assemble in readiness for echelon ploughing
- change over points for continuity during snow clearance
- turn around points
- salt stores for re-loading
- additional hazards for example; road over rail, road over road, SVB to nearside as well as offside, lane gain or lane drop

If standard plans are to be utilised then this must be stated.

Annex 5.1.1 Traffic Officer Service Winter and Severe Weather Briefing

Service Providers are required to hold winter and severe weather briefing sessions with the Traffic Officer and RCC supervisors. The content of the sessions should identify key aspects of the Severe Weather Plan and include:

- Extent of their network, staff involved and their various roles
- Winter Service treatment routes
- Snow ploughing techniques and capability
- The purpose of pre treatments and timing of treatments
- Introduction to weather conditions experienced including severe weather events
- Operational considerations for severe weather events
- Preparations – snow desk exercises, winter service vehicle maintenance, salt stocks, driver training, additional resources
- Procedures – process of obtaining a forecast, difference in detailed local and national advisory forecasts, considerations made, options for decisions on treatments, RWIS.
- Information available to winter service decision makers– weather forecast provider, weather stations
- Reporting
- How Traffic Officers can assist – in line with Traffic Officer Briefing Note 47

It is expected that each briefing will take no longer than 1 to 1.5 hours. To assist Service Providers a PowerPoint presentation briefing template is available from the Service Manager.

An attendance register for completion by all attendees at briefings is included below (Completed register to be forwarded to David O'Connor (David.OConnor@highways.gsi.gov.uk), 2/10 Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6HA).

Annex 5.1.2 Salt Stock Level Monitoring Procedures

1 Introduction

The Highways Agency require the salt stock level monitoring and reporting system to be updated on a daily basis on it's WRF1 reporting system throughout the winter season, commencing on 1 October and terminating on 30 April.

The object of the reporting system is to provide strategic monitoring of salt stock levels and to provide an early warning system to allow critical stock levels to be identified.

2 Capability Assessment

The methodology for the monitoring is based on an assessment of capability. The methodology for calculating capability is not intended to provide an indicative or typical treatment regime but simply provides a common basis on which capability information can be calculated and reported.

Capability is expressed in days and is: the number of days of continuous treatment across all routes, assuming six treatments per day at 20 g/m², and also assuming no re-supply. It is not suggested that this is a typical or common treatment regime but it does provide a worst case scenario against which a standard capability measurement can be derived. All capability calculations should be based on salt stocks dedicated to Highways Agency use. This will enable a national overview of stock levels to be taken as well as allowing area performance/DBFO teams the ability to identify, at an early stage, any issues which may affect service delivery

The **minimum capability** is the capability level, in days, assuming all salt storage facilities are at the minimum contractual stock levels.

The **maximum capability** is the capability level, in days, assuming all dedicated salt storage facilities are full to capacity.

The **actual capability** is the capability level, in days, based on the actual stock level held at that time.

The **reporting threshold** is the capability level at which point salt supplies could be considered to be critical. This level is defined by individual Service Providers. The level is not prescribed as it is the responsibility of individual Service Providers to assess local circumstances in defining an appropriate threshold. Climatic conditions, availability of haulage services, established mutual aid arrangements, and the proximity of the source of supply are all key considerations in defining appropriate threshold levels. Consideration also needs to be given to historical usage levels and existing re-supply arrangements in setting an appropriate threshold . It should be noted that this threshold capability level is for strategic reporting purposes only and is likely be different from stock level thresholds used for initiating re-supply.

The reporting threshold is likely to vary during the season and therefore the reporting threshold profile should be defined. Lower reporting threshold levels are likely to be applicable during the very early part of the season and then also towards the end of the season. The threshold level may also need to be increased to take into account potential supply difficulties that may be encountered during the Christmas and New Year holiday period.

The threshold profile should be reviewed on a regular basis and, if necessary, should be adjusted.

3 Advice on Assessment of Salt Stock 'Capability' Levels

Version	1	Amend.	8	Issue	July 09
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In general, a risk based approach should be taken when assessing capability levels and the following factors should be considered.

3.1 Climate

The climatic conditions within the Area need to be considered, particularly the severity of weather events and the likely number of continuous days treatment that may be required should be taken into account. For example, considering this factor on its own, an area in the South West such as Area 1 will require a lower reporting threshold than an area in the Midlands such as Area 11.

3.2 Time of Year

The time of year has a significant bearing on capability levels and a lower threshold may be appropriate in the low risk winter periods (November and March). Service Providers may want to reduce stock holdings towards the end of the season to avoid carrying stock during the summer months. However, care should be taken to ensure that the reduction in stock levels does not result in a reporting threshold that is not appropriate in the later winter months.

In addition to consideration of the winter risk periods, the Christmas and New Year break also needs to be taken into account as difficulties replenishing stock during this period may be encountered.

3.3 Proximity of Supply

The proximity of point of supply for salt, i.e. Winsford in Cheshire and Boulby in Redcar and Cleveland, is a significant factor when considering reporting thresholds. Clearly the nearer to the point of supply the lower the risk of securing re-supply and therefore the reporting threshold can be lower than in an area that is more distant from the point of supply. For example, considering this factor alone and assuming salt is procured from the local supplier, Areas 10 and 14 would have a lower reporting threshold than Areas 1 or 4.

3.4 Availability of Haulage Facilities

The ability of the Service Provider to provide his own haulage for salt can be taken into account when assessing reporting thresholds. However, the availability of vehicles, and drivers, may be limited during periods of severe weather and this will need to be considered.

3.5 Mutual Aid Arrangements

Existing arrangements with other organisations such as adjacent Service Providers and local authorities can be considered when assessing the reporting threshold. It should be noted however that these arrangements might not be very effective during times of prolonged severe weather as all organisation may be suffering from similar high demand and re-supply problems.

3.6 Stock Monitoring and Re-supply Arrangements

The contractual arrangements the Service Provider has in place with his salt supplier can be taken into account when considering the reporting threshold. For example, a supply contract which includes guarantees and associated payment mechanisms offers a lower risk to the Service Provider and a lower threshold could therefore be set. In addition, the use of more sophisticated and robust monitoring procedures as part of a supply management system may also decrease the risk of supply problems.

3.7 Other Considerations and Further Advice

There are other less significant factors that may be considered but the key factors remain the climatic conditions and the proximity of point of supply. Care should be taken not to include demand (salt usage) and 'reserves' as these are already taken into account in the capability calculation.

When considering reporting threshold the existing contractual requirements for stock levels may be taken into account although the reporting threshold may be higher or lower than the contracted minimum capability

Further advice is available from the Winter Service Delivery Team in the form of a Salt Capability Spreadsheet (Microsoft Excel spreadsheet) and Explanatory Notes (Microsoft PowerPoint slide show)

Annex 5.2.1 Severe Weather Plan Template

The 2009/2010 Severe Weather Plan Template replaces the 2008/09 Severe Weather Plan Template and should be used by Service Providers to update their individual Severe Weather Plans. The following changes have been made to the template. A summary of the changes that have been incorporated into the 2009/10 Severe Weather Plan template are listed below:

1. The title of the template has been amended to read Severe Weather Plan 2009/10
Information and Purpose – The definition under ‘Quality plan’ has been amended.
2. The following change has been made to Section 1 – Scope:
 - 1.6.4 Local Problems Areas – additional requirement to include known low humidity/low temperature areas.
3. Various changes have been made to Section 2 – General. These include:
 - 2.1.2.1 Process – additional wording ‘for both winter and severe weather conditions’
 - 2.1.2.4 –Guidance section moved from 2.1.2.5
 - Local Problem Areas Requiring Special Consideration – Title and section number changed to 2.1.3 – Mitigation Measures for Local Problem Areas
 - 2.1.3 to 2.1.14 sections renumbered
 - 2.1.7.6 – Winter Service and Severe Weather Briefings for Traffic Officer Service – additional wording added to last bullet point, ‘and instances of ice on the network’
 - 2.1.14 Winter Service and Severe Weather Timetable – Key dates have been updated and additional monthly reporting requirement has been added.
4. Various changes have been made to Section 3 – Winter. These include:
 - A new sub section has been added to the Resources 3.1.1.1 Special Considerations – reference 3.1.1.7 changed to 3.1.2.7
 - 3.1.2.5 Low Humidity – Note added regarding issue of further guidance
 - 3.1.2.6 Freezing Rain - Note added regarding issue of further guidance
 - 3.1.2.7 – Sustained Low Temperatures – section re- worded
 - 3.3.2.4 Supply Arrangements – Additional requirement to document secondary supplier backed up with evidence for choice.
 - 3.3.2.6 Monitoring and Reporting – Additional paragraph added to highlight forthcoming changes to AMM 76/06.

THIS PAGE TO BE REMOVED FROM FINAL COMPILED DOCUMENT

Notes for compiler:

This document is a template against which individual Service Providers can base their own individual Severe Weather plans.

Instructions and guidance are shown in italics e.g. *Service Provider to include details of*

Square brackets denote a requirement for area/route specific text e.g. Details of the [AreaNo/Route DBFO] network are.....

Any of the text, and other content, within this document template can be modified to make applicable to local circumstances however, all of the text in red should be removed, completed, replaced or amended as appropriate.

As the Severe Weather plans will be public documents it is recommended that, to ensure consistency between documents, the basic style and formatting of the template should not be altered.

Tables should be completed as appropriate or replaced with the Service Providers own tables. Where the Service Provider's own tables are used they should include, as a minimum, the information detailed within the prescribed tables.

The standard forms included at Appendix 11 are primarily for notification to the Highways Agency and therefore, to allow for easy assimilation of information by the Highways Agency, the format of these forms should not be changed

[SERVICE PROVIDER]

[AREA OF RESPONSIBILITY]
SEVERE WEATHER PLAN
(2009/2010)

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INTRODUCTION AND PURPOSE

In conjunction with the Network Management Manual, this severe weather plan describes the policy, objectives, procedures and operational arrangements for the delivery of winter service and details the alert procedures and actions in the event of severe weather on the [Area No / Route DBFO] network.

The document serves a number of more specific purposes:

Policy Document

The severe weather plan sets out the Highways Agency's policy and objectives in the context of local service delivery.

Contract Document

The severe weather plan outlines the key contractual responsibilities of the Highways Agency and their Service Provider/s including the monitoring and reporting of salt stock levels.

Quality Plan

The severe weather plan forms part of Service Provider's quality or business management system.

Contingency Plan

The severe weather plan is linked with the Highways Agency's wider contingency arrangements.

Operations Manual

The severe weather plan describes the processes, procedures and operational arrangements for those responsible for delivering winter services and details the alert procedures and actions in the event of severe weather.

Reference Document

The severe weather plan is a comprehensive reference document.

DOCUMENT CONTROL AND DISTRIBUTION**Document Owner**

Document Owner	[Name/Title]
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The owner is responsible for maintenance, upkeep and amendment.

Document Control

Document Issue and Revision Record				
Issue	Revision	Date	Issue/Revision Description	Approved

Distribution

Document Distribution List		
Copy Number	Name	Organisation

The distribution list should include: relevant Service Provider staff, TMC and sub-contractor staff, Highways Agency staff, police authorities, highway authorities, Highways Agency Service Providers (including DBFO companies) and any other key stakeholders such as weather forecast providers. The internal document distribution should include all decision makers and managers. Where necessary, this distribution list can be included as a separate appendix to the document.

The above document control and document distribution tables should be amended to comply with individual organisations' own quality management procedures.

Documents should preferably be distributed electronically and, to preserve format and maintain document control and security, PDF format is recommended.

1 SCOPE

1.1 Introduction (Scope)

This section of the severe weather plan outlines the scope of the services provided, responsibilities for provision of those services and details the extent of the network on which the service is provided.

[Service Provider] to ensure that the operational activities contained in this plan dovetail with other Highways Agency's Winter Plans (e.g. Traffic Officer's Severe Weather Plan)

1.2 Policy Framework (Statement of Service)

1.2.1 Policy

It is the Highways Agency's policy to ensure, so far as is reasonably practicable, that safe passage along the highway is not endangered by snow or ice, and alert procedures and actions are taken in the case of floods, severe gales, fog and heat waves.

[Service Provider] must implement the Highways Agency's policy [within Area No / on the Route DBFO] in an efficient and safe manner and should endeavour, in so doing, to minimise delays to road users.

1.3 Severe Weather Warning Systems and Definitions

1.3.1 Weather Warning Systems

<i>The National Severe Weather Warning System (NSWWS)</i>	
Regional Advisory of Severe or Extreme Weather Warning (Advisory)	Advisories are issued by 1300 daily as routine and indicate confidence of expected severe or extreme weather. Early and flash warnings supersede advisories when confidence levels are 60% or greater.
UK Advanced Warning of Severe Weather (Early Warning)	An early warning of severe weather will normally be issued up to several days in advance whenever the overall risk of widespread disruption in any UK region is 60% or greater.
Regional Severe Weather Warning (Flash Warning)	Flash warnings of severe weather are issued when confidence of an event reaching specified criteria is above 80%, and should give a minimum of two hours notice. Warnings are issued for every affected county or unitary authority.
<i>Flood Forecasting Centre (EA/Met Office)</i>	
Extreme Rain Fall Alert	The ERA Service is designed to alert emergency responders in England and Wales to the possibility of urban surface water flooding as a result of extreme rainfall
<i>The Environment Agency Flood Warning System</i>	
Flood Watch	Flooding of low lying land and roads is expected. Be aware, be prepared, watch out.

Flood Warning	Flooding of homes and businesses is expected. Act now!
Severe Flood Warning	Severe flooding is expected. There is extreme danger to life and property. Act now!
All Clear	Flood Watches or Warnings are no longer in force for this area

1.3.2 Severe Weather Definitions

The following weather definitions are provided by the Meteorological Office.

<i>Weather</i>	<i>Definition</i>
Heavy Snow	More than 2cm per hour of snow for at least 2 hours
Blizzards/drifting snow	<ul style="list-style-type: none"> a. Moderate or heavy snow combined with winds of 30mph or more with visibility reduced to 200 metres or less or:- b. Drifting snow giving rise to similar conditions
Very heavy snowfall, blizzards or drifting snow	Expected to give depths of 15cm or more potentially resulting in widespread dislocation of communications. Blizzards are severe when visibility is reduced to near zero.
Freezing rain or fog / widespread icy roads	Generally occurs when rain or fog freezes on contact with road surfaces
Heavy rain	<ul style="list-style-type: none"> a. Expected to persist for at least 2 hours and to give more than 1.5cm of rain within a 3 hour period or:- b. More than 2.5cm per day on already saturated ground.
Severe Gales	Repeated gusts of 70mph or more over inland areas, with a risk to high-sided vehicles being blown over.
Storms	Repeated gusts of 80mph or more over inland areas, which could cause cars to be blown out of their lane on the carriageway.
Fog	The official definition of fog is visibility of less than 1000 metres. Whereas for a motorist; visibility of less than 200 metres is more realistic. Severe disruption to transport occurs when the visibility falls below 50 metres.
Heat wave	<p>When there is an 80% chance of extremely high temperatures on at least two consecutive days, a heat wave warning is issued.</p> <p>The temperature thresholds vary by region, but an average threshold temperature is 30°C by day and 15°C overnight. (source Heat-Health Watch, which operates in association with the Department of Health and the Welsh Assembly).</p>

1.4 Service and Performance Standards

1.4.1 Winter Service Response and Treatment Times

It is the Highways Agency's objective to keep all carriageways clear of snow and ice. This is achieved by undertaking precautionary treatments and/or reactive treatments to prevent the formation of ice or accumulation of snow.

Treatment is based on the following response and treatment times:

Response time is [1 hour]. Response time is defined as the maximum time taken from the decision to treat until the winter service vehicles are loaded, manned and ready to leave the compound. Where the decision is taken more than one hour before the planned treatment time, the response time is no longer applicable.

Treatment time is [2 hours]. Treatment time is defined as the maximum time taken from leaving the compound through to returning to the compound after completion of the treatment route.

1.4.2 Risk Periods

1.4.2.1 Winter Service

Winter Service weather types include Snow, Ice and Freezing Rain/Fog.

Three winter service periods are defined, for planning and operational purposes only, as follows:

Risk	Risk Periods (months)
High	December, January and February
Low	November and March
Marginal	October and April

1.4.2.2 Severe Weather

The following weather types and their expectant risk periods are based on statistics provided by the Meteorological Office.

Weather Type	Risk Periods (months)
Floods, Heavy Rain	January through to December
Gales, Wind	January to June, September to December
Fog	October, November, December and January
Heat wave, High Temperatures	June, July and August

Risk periods may not be relevant to all contracts and therefore this section can be removed if risk periods have no operational significance.

1.5 Contractual Arrangements

Note: delete and amend the following sections as appropriate.

Winter service duties including precautionary salting, reactive salting, snow clearance and the purchase of / maintaining sufficient salt stock levels are the responsibility of the Highways Agency Service Provider.

Severe weather duties including operational considerations, alert procedures and actions are the responsibility of the Highways Agency Service Provider.

The Area Performance Team / Department's Nominee must be closely involved in any planning activities. The Joint Operating Principles states that the Traffic Officer Service must have no input into the decision making process other than providing information on network issues including recovery of abandoned vehicles to the Highways Agency Service Provider (via the RCC and NCC). Further guidance on the role of the Traffic Officer Service during the winter season will be issued before the start of the winter season.

1.5.1 Role of Employer (the Highways Agency)

The Highways Agency is responsible for following:

- 1) Setting the overall policy on the provision of winter services on the motorway and trunk road network.
- 2) Co-ordination of operations at a regional and national level at times of severe weather.
- 3) Overseeing operation management and performance.
- 4) Provision of winter service compounds.
- 5) Provision of winter service vehicles and equipment.
- 6) Provision of reserve and specialist plant and equipment.
- 7) Provision of ice prediction services.
- 8) Liaison with the media.
- 9) Provision of Traffic Officer Service

1.5.2 Role of Service Provider (MAC or DBFO)

[Service Provider name] is responsible for:

- 1) Development of the severe weather plan.
- 2) Implementation of the severe weather plan and delivery of service as defined in the plan.
- 3) Design of winter service treatment routes.
- 4) Procurement of weather forecasting services.
- 5) Day to day decision making and operational management.
- 6) Supply of plant, labour and materials.
- 7) Maintenance and operation of Highways Agency vehicles, compounds and equipment.

- 8) Liaison with the media (DBFO Companies only).
- 9) Reporting to the Highways Agency.
- 10) Monitoring and reviewing performance.

1.5.3 Role of Managing Agent (MA)

[MA name] is the managing agent and the engineer for the term maintenance contract and is responsible for:

- 1) Development of the severe weather plan
- 2) Implementation of the severe weather plan and delivery of service as defined in the plan.
- 3) Procurement of weather forecasting services.
- 4) Day to day decision making and operational management.
- 5) Reporting to the Highways Agency.
- 6) Monitoring and reviewing performance.

1.5.4 Role of Term Maintenance Contractor (TMC)

[TMC name] is the term maintenance contractor and is responsible for:

- 1) Execution of the severe weather plan and delivery of service as defined in the plan.
- 2) Design of winter service treatment routes.
- 3) Day to day operational management.
- 4) Supply of plant, labour and materials.
- 5) Reporting to the MA.
- 6) Maintenance and operation of Highways Agency vehicles, compounds and equipment.

1.6 Network

1.6.1 Description of Network

The Service Provider may wish to include a description of their area or route including general details or features that may impact on winter service operations and areas most likely to be affected by severe weather. Specific network features relating to winter service and severe weather should be detailed in Sections 3.2 and 4.2 respectively.

1.6.2 Extent of Network

The extent of network covered by this plan is shown in the following table and also detailed in the Area Map at Appendix A.2. The key interfaces are defined in the Interface Drawings which are included within Appendix A.3.

Road	Extent
[A999]	From [x] to [y]

Service Provider to include details of footway and cycle track routes to be treated.

Category	From	To	Route Description	Plan

The above table should include details of all footways and cycle tracks Categorised as 1a, 1, 2 and 3. There is no need to detail those at category 4 as this will simply be the remainder of the network. Plans should be included at Appendix A.2 and appropriate cross references included in the above table.

Under certain situations, winter service treatments may be undertaken on other adjacent networks. The arrangements are described in section 2.1.10.

1.6.3 Network Features

Winter specific network features can be found in section 3.2. Severe weather specific network features can be found in section 4.2

Emergency Crossings

The following table should be completed, highlighting the location and type of emergency crossings (winter service vehicle turning facilities) that exist on the network. Details of operation and maintenance of these facilities should be included in section 3.1.3.1 and appropriate cross-references included. Specifically, a cross reference to the details contained in the Contingency Plan on emergency crossing points (removable sections of barrier) should be included.

Road	Location	Type
[A999]		

Solid Vertical Barrier

The following table should be completed, highlighting the location and length of Solid Vertical Barrier that exist on the network. . Details of inspection and maintenance to these barriers should be included in section 3.1.3.2 and appropriate cross-references included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

1.6.4 Local Problem Areas

Include here a description and location of any known problem areas or trouble spots such as:

- parts of the network at high altitude;*
- areas prone to low temperature/low humidity conditions where special measures may be required*
- sections of road of a gradient that may result in problems in certain conditions e.g. jack knifed lorries;*
- areas commonly prone to climatic conditions such as strong cross winds that would result in drifting;*
- any structures where differential treatments or special measure may be required, and;*
- areas where, from experience, particular problems arise where the service provision can be hampered.*

The process for review and identification of problem areas (cross referenced to section 2.1.3) should be detailed.

Reference should be made to section 2.1.3 which must detail appropriate mitigation measures.

Location	Problem
[A999]	

2 GENERAL

2.1 Operations

2.1.1 Introduction (Operations)

This section of the severe weather plan contains [Service Provider's] detailed operational procedures for delivery of winter services and details the alert procedures and actions in the event of severe weather on the [Area No/Route DBFO] network and includes arrangements for liaison and co-operation with adjacent providers to promote delivery of a consistent and co-ordinated service across all boundaries.

Service Provider to include area specific introduction as appropriate.

2.1.2 General Arrangements and Decision Making

2.1.2.1 Process

Service Provider to include a detailed description of the process including forecast, decision, instruction, treatment, monitoring loop and command and control arrangements for both winter service and severe weather events. (Use of a flowchart process diagram is considered best practice).

2.1.2.2 Decision Maker (Definition of Roles)

Service Provider to include details of the decision maker(s) e.g. Duty Officer and definition of the role(s).

A cross reference to section 2.2.2.1 should be included.

2.1.2.3 Duty Rota

Service Provider to include duty rotas for all personnel involved in winter service and severe weather operations

The Decision Maker Duty Rota is included at Appendix A.12.

2.1.2.4 Guidance

[Service Provider] must take account of relevant Highways Agency advice and guidance including AMM's [and the Network Management Manual *as appropriate*].

2.1.3 Mitigation measures for Local Problem Areas

There are a number of known problem areas requiring special consideration within [area/route], as identified in section 1.6.4. The following table shows the considerations and mitigation measures identified in respect of these problem areas.

Location	Problem	Special Considerations & Mitigation Measures

2.1.4 Abandoned Vehicles

Where an abandoned vehicle is hampering snow clearing or clear up operations the removal from the road, or removal to another part of the road, may be required. Wherever possible the owner will be contacted and requested to remove the vehicle directly but in certain circumstances it may not be appropriate, or possible, for the owner to attend to the vehicle. Only the Police/Traffic Officers have the authority to move a vehicle in these circumstances and therefore contact will be made through normal liaison arrangements, or via the RCC, and an instruction sought from a Police/Traffic Officer for the vehicle to be moved (Where a number of vehicles have to be moved details of every individual vehicle will be given to the Police/Traffic Officer and specific instruction sought for each individual vehicle). The specific details of the vehicles, its location and the reason why it needs to be moved will be provided to the Police/Traffic Officer and a log of all communications kept. **[Service Provider] must only move vehicles once an instruction from a Police/Traffic Officer has been received.**

Where owners do leave their vehicles information relating to their location and contact details will be obtained and lodged with the severe weather desk, Network Control Centre and RCC.

Service Provider to include details of arrangements for moving vehicles including equipment to be used and procedures to be followed and contact details for relevant organisations and supply chain.

2.1.5 Road Traffic Accidents

Any road traffic accident involving [the Highways Agency’s own vehicles / any winter service vehicle] will be reported to the Service Manager and the Regional Winter Service Coordinator. The report must be made on form DfT 20001 and must be submitted as soon as possible but no later than before 9am the following working day. Where the accident involves a fatality or serious injury report must be made immediately.

Service Provider to amend the above text to match contractual requirements. Where there is no contractual requirement in respect of provider vehicles, details for report should still be included.

2.1.6 Escalation

Snow and severe weather events should normally be managed by each respective area team and contingency plan arrangements must only be enacted if the planned response is insufficient to cope with exceptional weather conditions, if procedures fail or if an incident is compounded by a series of

further incidents. Emergency customer welfare arrangements are detailed within the contingency plan.

Service Provider to define escalation arrangements including specific details of how the establishment of the severe weather desk and activation of the contingency plans are related.

2.1.6.1 Establishment of Severe Weather Desk

The severe weather desk must be established prior to the forecasted commencement of severe weather that could cause disruption to the network or snow falls that are likely to be sufficient to settle on the carriageway and substantially hinder the passage of traffic or as soon as possible in the event of un-forecast snow falls or severe weather.

The severe weather desk must be established at [location].

The severe weather desk/control room will have the ability to communicate directly with motoring organisations and local authorities and to listen to/watch local news/traffic media.

Where decisions, and their implications, require strategic oversight they will be referred to the Service Manager.

The Severe Weather Desk Duty Rota is included at Appendix A.13.

2.1.6.2 Activation of Contingency Plan

This [title] contingency plan must be activated when a staff member becomes aware of a major or critical incident taking place and they must immediately put in place the actions outlined within the contingency plan.

Service Provider to include a detailed description of the escalation procedures and severe weather desk arrangements including preparation, establishment and operation.

2.1.7 Liaison and Communication

2.1.7.1 Notification of Treatments

[Service Provider] must notify the Highways Agency, [weather forecast provider], police, adjacent Service Providers and local highway authorities [others?] of all proposed treatments once known, but not normally later than 16:00 each day.

[Service Provider] must, as soon as practicable, notify the Highways Agency, [weather forecast provider], police, adjacent Service Providers and local highway authorities [others?] of other actions including changes to planned treatments, reactive treatments and snow clearance.

The WRF1 system must be used for the above notifications. Where the system is unavailable the forms at Appendix A.11 must be used.

All notifications must be made using the WRF1 system unless agreement is reached with recipients for transmission by other means.

A comprehensive external contact list can be found in Appendix A.9.

2.1.7.2 Daily Reports

Before 10:00 each day [Service Provider] must provide a daily operational report to the Service Manager, detailing the treatments carried out over the last 24 hours and any relevant issues that have arisen during that period.

The report must be submitted using the WRF1 system. Further guidance can be found in AMM 91/07 – Winter and Business Continuity Reporting Arrangements, a copy of which can be found in Appendix A.10.

2.1.7.3 Hourly Updates

When weather conditions on the network are such that the flow of traffic is hindered [Service Provider] must provide the Highways Agency with hourly updates describing the current condition of the network and detailing the ongoing and proposed winter service and severe weather operations.

The report must be submitted using the WRF1 system.

2.1.7.4 Media Liaison

In order to facilitate media liaison [Service Provider] must make available to the Service Manager and/or Highways Agency press officers such information as requested. Direct liaison with the media must only take place when directed by the Service Manager.

2.1.7.5 Internal Communication Arrangements

Internal communication is by [radio/cellular telephone].

The arrangements for backup communications are [details].

Service Provider to include details of internal communication arrangements including contingency arrangements.

A comprehensive internal contact list can be found in Appendix A.8.

2.1.7.6 Winter Service and Severe Weather Briefings for Traffic Officer Service

[Service Provider] must hold winter service and severe weather briefing sessions with the Traffic Officer Service in [Area] prior to the end of October). The contents of these sessions should identify key aspects of the Severe Weather Plan. On completion of the briefing, the Service Provider must ensure that the training register (appended in AMM xx/08) is completed by the Traffic Officers being briefed.

Due to the differing content of the severe weather plans it is expected that the briefings held by each Service Provider will not be identical. For example, these sessions should identify the following:

- Extent of the network, staff involved and various roles

- Treatment routes
- Introduction to weather conditions experienced including severe weather events and instances of ice on the network

[AMM xx/09](#) contains further details of what the Service Provider should expect to provide in the Winter Service and Severe Weather Briefings.

A copy of AMM xx/09 can be found in Appendix A.10.

2.1.8 Liaison with major highway schemes

Service Provider to include advanced notification of any major schemes across the network and contacts for any such schemes in the table below to maintain continuity with all winter treatments and any severe weather procedures and actions.

Road	Location (e.g. junction to junction)	Type of scheme	Contact
[A999]			

2.1.9 Weather Forecasting and Road Weather Information System (RWIS)

2.1.9.1 General Arrangements

[Service Provider] obtains weather forecasting service from [provider]. The services provided are [services]. *Service Provider to include details of suppliers and contracted services for weather forecasting.*

[Service Provider] obtains ice prediction service through the Highways Agency’s RWIS Bureau Service.

Faults on the RWIS Bureau Service or any of the RWIS Outstations must be reported as soon as possible to the Bureau Service Contractor or the Outstation Operation & Maintenance Contractor as appropriate. Contact details can be found in Appendix A.9.

2.1.9.2 National Domain Network of Weather Stations

Include map

2.1.9.3 Domain Arrangements

Domain arrangements are described in the following table and detailed on the Area Map in Appendix A.2.

Domain	Outstations	Routes

2.1.10 Records

Collection of good quality records is fundamental to defend against liability claims made in respect of winter service delivery and any actions taken in the case of floods, severe gales, fog and heat wave. **The table below demonstrates the detailed record information that [Service Provider] must retain:**

Information	Record Content	Format	Storage Media	Retention Period
Weather Forecast				
Actual Weather Conditions				
Reports received				
Decisions made				
Instructions made				
Confirmations				
Actions taken				
Liaison and communications log				
Telephone conversations including with forecast provider				
Material usage				
Fleet breakdowns				

Times taken to complete treatments				
Use of additional resources (including reserve fleet and mutual aid)				
Road Closures/blockages due to weather conditions				
Complaints received relating to conditions due to weather				

Records must be available for inspection in accordance with individual contracts

Service Provider to refer to individual contracts for details of retention period and storage media - refer to individual contracts.

2.1.11 Health and Safety

Service Provider to include a statement on Health and Safety covering the operational aspects of severe weather and winter service e.g. treatment speed, ploughing, loading and off-loading, manning levels, PPE, welfare, rations, communications and the safety of other road users.

2.1.12 Mutual Aid

Service Provider to include a statement explaining what mutual aid arrangements are in place.

[Service Provider] must take into consideration information contained within AMM 51/04 or the Network Management Manual as appropriate], a copy of which is attached at Appendix A.10

2.1.13 Review

Service Provider to include details of review procedures, including responsibility and criteria for review e.g. failure to meet service or performance standards, continuous improvement initiatives and end of season review.

Typical issues for the review may include:

- *response and treatment times,*
- *decision making,*
- *command and control,*
- *escalation and severe weather desk,*
- *liaison and communications,*
- *weather forecasting and ice prediction,*
- *actual weather conditions,*
- *operational issues,*
- *records,*
- *health and safety,*
- *human resources,*
- *vehicles and plant,*
- *de-icing materials,*
- *compounds and facilities,*
- *other issues e.g. traffic flow, adjacent roads etc. and*
- *areas for improvement.*
- *Identified problem areas on the network.*

2.1.14 Winter Service & Severe Weather Timetable

The following table sets out key dates in the delivery of winter service.

Date	Who	Action
8 June 09	SP	Pre-season review and preparation
21 August 09	SP	Submit Severe Weather Plan
18 September 09	HA APT	Check / accept SW Plan
18 September 09	HA NWT	Check / accept SW Plan (to HA APT)
1 October 2009		Winter Season Commences
Monthly from 1 October 2009	SP	Monthly report to include salt stocks, salt usage, position statement on salt stock levels and analysis of forward usage (AMM xx/xx)
31 March 2010	SP	Finalise list of key issues to feed into regional winter & severe weather workshops
30 April 2010		Winter Season Concludes
May 2010	SP	'May' winter & severe weather review
June 2010	SP	Winter & severe weather report to HA

Service Provider to include any other relevant dates in the table.

2.2 Resources

2.2.1 Introduction

This section of the severe weather plan contains details of the resources available for delivery of winter services and the alert procedures and actions in the event of severe weather on the [Area No/Route DBFO] Network including reserve and contingency arrangements.

Service Provider to include area specific introduction as appropriate.

2.2.2 Human Resources

2.2.2.1 Definitions

The following table defines the key personal responsible for delivery of the services defined within this document.

Function	Title	Name
Network Manager		
Duty Officer		
Decision Maker		

The above table should be completed to include all relevant Service Provider personnel. Where possible, consistency of naming should be maintained. The table should include the person with overall responsibility (Network Manager), the person who has day to day responsibility for winter service/severe weather and would be the first point of contact (Duty Officer) and the person responsible for monitoring weather and road conditions and making decisions (Decision Maker). These functions are likely to have different titles within each organisation.

2.2.2.2 Training

Service Provider to include a general statement on training together with details of qualification standards for drivers supervisors, depot supervisors and decision makers. Reference to training on this plan should be included.

Training Records are detailed at Appendix A.15.

2.2.2.3 Organogram

Service Provider to include an organogram detailing the structure of the organisation.

2.2.2.4 Manning Levels

[Service Provider] has [?] qualified drivers for winter service operations on the [Area No/Route DBFO] network as detailed in Appendix A.6, which meets the Highways Agency’s specified minimum resource levels of three times the number of operational vehicles plus twenty five percent.

2.2.3 Compounds and Facilities

2.2.3.1 Compounds and Depots

A schedule of compounds and depots covering the [Area No/Route DBFO] network can be found in the compounds, depots and facilities schedule which should be included in Appendix A.7.

2.2.3.2 Fuel

The following table indicates the fuel type (including grade) and details of supply and storage arrangements including minimum stock levels.

Depot	Supplier	Fuel Type & Grade	Maximum fuel storage capacity (Gas Oil Litres)	Maximum fuel storage capacity (DERV Litres)	Minimum fuel storage (Litres)

[Service Provider] must monitor fuel stock levels regularly during the winter period.

When there is a possibility of disruption of fuel supply or when stocks are low then [Service Provider] must report fuel stock information using the WRF1 electronic reporting system by 16:00 hours on a daily basis. Details of the reporting requirements are detailed in AMM 91/07 at Appendix A.10.

The Service Provider must include within the table below details of fuel supply contingency and pump maintenance arrangements.

Depot	Contingency Arrangements	Pump Maintenance Arrangements

2.2.3.3 Other Facilities

A schedule of other facilities that are available to service the [Area No/Route DBFO] network can be found in Appendix A.7.

Examples of "other facilities" include facilities that are provided for severe weather working or as contingency.

2.2.4 Winter Service and Severe Weather Infrastructure Inventory

2.2.4.1 Description

The inventory is stored on a MS Access database containing detailed information relating to [Service Provider's] compounds and the Highways Agency compounds and winter fleet. This inventory is a database which requires updating to reflect any changes.

2.2.4.2 Database management

[Service Provider] will review and update the information held by the Highways Agency during both January/February and June/July each year.

3 WINTER

3.1 Operations

3.1.1 Decision Making and Treatment Matrix

Decisions are made primarily in the interest of service delivery and continuity and takes account of weather and decision information from adjacent Highways Agency Service Providers and relevant local authorities.

All decisions are subject to continuous monitoring, recording & review.

All winter decisions are evidence based and are made in accordance with the guidance contained within the following decision and treatment matrices:

Suggested decision making and treatment matrices for precautionary treatment are shown in the following pages. Service Providers should modify these as necessary to suit their own specific local circumstances.

During periods of forecast severe weather [Service Provider] must remain in contact with [forecast provider] and should also take account of information from staff out on the network and from CCTV when making decisions.

Decision Matrix Guide

		Predicted Road Conditions		
Road Surface Temperature	Precipitation etc.	Wet	Wet Patches	Dry
May fall below 1°C	<u>No</u> rain <u>No</u> hoar frost <u>No</u> fog	Salt before frost	Salt before frost (see note A)	No action likely, monitor weather (see note A)
	<u>No</u> rain <u>No</u> hoar frost <u>No</u> fog		Salt before frost (see note B)	
Expected to fall below 1°C	<u>Expected</u> hoar frost <u>Expected</u> fog	Salt after rain stops		
	<u>Expected</u> rain <u>BEFORE</u> freezing	Salt before frost and after rain stops (see note C)		
	<u>Expected</u> rain <u>DURING</u> freezing	Salt before frost		
	<u>Possible</u> rain <u>Possible</u> hoar frost <u>Possible</u> fog	Salt before frost		Monitor weather conditions
<u>Expected</u> snow		Salt before snow fall		
Freezing Rain	Before rain	Salt before rainfall (see note C)		
	During rain	Salt during rainfall (see note C)		
	After rain	Salt after rainfall (see note C)		
<i>The decision to undertake precautionary treatments should, if appropriate, be adjusted to take account of residual salt or surface moisture.</i>				

- A. Particular attention should be given to any possibility of water running across carriageways and such locations should be monitored and treated as required.
- B. When a weather warning contains reference to expected hoarfrost considerable deposits of frost are likely to occur and close monitoring will be required. Particular attention should be given to the timing of precautionary treatments due to the possibility that salt deposited on a dry road may be dispersed before it can become effective.
- C. Under these circumstances rain will freeze on contact with running surfaces and full pre-treatment should be provided even on dry roads. This is a most serious condition and should be monitored closely and continuously throughout the danger period.

Treatment Matrix Guide

Weather Conditions Road Surface Conditions Road Surface Temperature (RST)	Air Temp	Treatment	
		Salting (g/m ²)	Ploughing
Frost or forecast frost RST at or above -2°C		10	No
Frost or forecast frost RST below - 2°C and above - 5°C		20	No
Frost or forecast frost RST at or below - 5°C and above -10°C and dry or damp road conditions		20	No
Frost or forecast frost RST at or below - 5°C and above -10°C and wet road conditions (existing or anticipated)		2 x 20	No
Light snow forecast (<10mm)		20	No
Medium/heavy snow or freezing rain forecast		2 x 20	No
Freezing rain falling		20 (successive)	No
After freezing rain		20	No
Ice formed (minor accumulations)	above -5°C	20	No
Ice formed	at or below -5°C	2 x 20	No
Snow covering exceeding 30mm		20 (successive)	Yes
Hard packed snow/ice	above - 8°C	20 (successive)	No
Hard packed snow/ice	at or below - 8°C	salt/abrasive (successive)	No
<i>Rate of spread for precautionary treatments may be adjusted to take account of residual salt or surface moisture unless stated otherwise within NMM 5.6.4 (extracted from AMM 36-02).</i>			

A revised treatment matrix, including advice on pre-wet treatment, shall be provided to service providers in August 2009 prior to the commencement of the winter season.

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page

3.1.1.1 Special Considerations

The treatment of hard packed snow/ice using salt alone can result in an uneven and slippery surface and therefore, in such circumstances, the addition of abrasives must be considered (see section 3.3.2.1).

In low humidity conditions [Service Provider] must follow the procedures described in section 3.1.2.5.

Where the effectiveness of treatment may be affected by surface type [Service Provider] must follow the procedures described in sections 3.1.2.3 and 3.1.2.4.

Service Providers will need to adjust the treatments to suit local circumstances for example, salt stored in the open or to meet contract promises.

In circumstances where temperatures of less than -10°C are sustained [Service Provider] must implement the procedure detailed in section 3.1.2.7.

In circumstances where freezing rain is forecast [Service Provider] must implement the procedures described in section 3.1.2.6.

3.1.2 De-icing Treatment

3.1.2.1 Treatment Type

Service Provider to include details of the treatment type(s) across the network e.g. salt, pre-wetted salt, treated salt, urea etc. A reference to Section 3.3.2 and Appendix A.4 should be included

Service Provider to include details for the treatment of footways, cycle tracks and paved pedestrian areas where appropriate.

3.1.2.2 Spreading Techniques & Operational Considerations

Service Provider to include details of the spreading techniques, for different types of carriageway and location.

This section should include specific details of any sections of road of more than three lanes and describe the approach taken to ensure adequate treatment of all parts of the carriageway.

Service Provider to include operational considerations as appropriate e.g. treatment of special structures, treatment during peak traffic flow periods, road works, treatment within tunnels, road over road bridges, operations near railways and innovative trials. Full details should also be included in the route schedule (Appendix A.4) and a cross reference included within this section.

Guidance on working in close proximity to railways can be found in Circular ROADS no 18/77, a copy of which is appended at Appendix A.10.

3.1.2.3 Porous Asphalt

[Service Provider] must give special consideration to the treatment of Porous Asphalt and must take account of the information contained in the Network Management Manual a copy of which is attached at Appendix A.10.

Service Provider to include Porous Asphalt site details (including appropriate references within their treatment route schedules) and a description of the practical measures proposed.

A cross reference to section 1.6.4 and 2.1.2.4 should be included

Delete this section if not applicable.

3.1.2.4 Thin Surfacing

[Service Provider] must give special consideration to the treatment of Thin Surfacing and must take account of the information contained in the [AMM 36/02 or the Network Management Manual as appropriate] a copy of which is attached at Appendix A.10.

Service Provider to include Thin Surfacing site details (including appropriate references within their treatment route schedules) and a description of the practical measures proposed.

3.1.2.5 Low Humidity

[Service Provider] must give special consideration to precautionary treatments during low humidity conditions and must take account of the information contained in AMM 34/02 or the Network Management Manual as appropriate] a copy of which is attached at Appendix A.10.

Following events during the 2008/09 winter season additional guidance will be issued prior to the 2009/10 winter season.

Service Provider to include full details of the practical measures proposed.

3.1.2.6 Freezing Rain

[Service Provider] must give special consideration to the treatments required before during and after freezing rain and must take account of the information contained in [AMM 62/05 or the Network Management Manual as appropriate] a copy of which is attached at Appendix A.10.

Following research undertaken during 2008/09 further guidance will be issued to clarify the Service Providers procedures for dealing with Freezing Rain.

Service Provider to include full details of the practical measures proposed including details of the pre-treatment arrangements, procedures for warning motorists and closing roads where appropriate and necessary. The procedure should include details of reactive treatment arrangements and materials to be used, for example a salt/abrasive mix.

3.1.2.7 Sustained Low Temperatures

Service Provider to include full details of procedures for dealing with circumstances where temperatures of less than -10 C are sustained for example the addition of calcium chloride.

Further guidance can be sought from the National Winter Teams Regional Winter Service Co-ordinator.

3.1.2.8 Salt Bins and Salt Heaps

Service Provider to include full details of locations of salt heaps and salt bins and describe the re-supply arrangements.

3.1.3 Snow Clearance

3.1.3.1 Ploughing & Clearance Techniques and Operational Considerations.

Service Provider to include details and procedures for ploughing, including clearly defined decision points for the fitment of ploughs and commencement of ploughing, and plough height settings.

This section must include specific details of any sections of road of more than three lanes and describe the approach taken to snow clearance including specific details of which lanes snow is to be ploughed.

Service Provider to include procedures for bulk removal of snow including any identified areas where snow can temporarily be stockpiled.

Service Provider to include operational considerations as appropriate e.g. maintenance of snow fences, operation of snow gates, use of emergency crossings, road over road bridges, ALL (Abnormal Indivisible Load) movements and operations near railways.

It is important that all the defined routes are cleared and that no area is abandoned for the sake of concentrating resources to one or two problem areas. In all cases therefore the defined treatment routes will be adhered to, and where conditions demand a more intensive treatment in specific areas, this will be achieved by calling out a reserve vehicle for those areas.

3.1.3.2 Snow clearance and solid vertical barriers

Numerous major maintenance schemes require the installation of lengths of vertical concrete/other solid barrier throughout the motorway and trunk road network which can pose problems regarding snow clearance. New guidance provided in AMM 89/07 or the Network Management Manual as appropriate (a copy of which is attached at Appendix A10) provides the relevant information for dealing with snowfall in circumstances where traditional ploughing techniques may not be applicable due to the presence of a vertical concrete barrier.

[Service Provider] should consider whether any lanes may need to be abandoned during periods of prolonged heavy snowfall due to the problems associated with ploughing adjacent to vertical concrete barriers.

When conditions dictate it is recognised that it is acceptable to plough snow from lane 2 to the right and sacrifice one or more running lanes to stack snow whilst keeping the maximum number of lanes available to traffic for each route classification and maintaining access and egress.

[Service Provider] must produce a schedule identifying the locations of vertical concrete/other solid barrier on their network and a clearance plan for each location to be included within the Severe Weather Plan as Appendix A.16. This schedule should also be cross referenced to Appendix A.4 - route drawings and schedules. Alternatively, the schedule may form part of the route schedules.

[Service Provider] must give special consideration to snow clearance where solid vertical barriers are present and must take account of the information contained in AMM 89/07.

3.1.3.3 Aftercare and follow up Treatments

Service Provider to include details of aftercare and follow up treatments e.g. clearing side roads and lay-bys.

3.1.3.4 Arrangements for use of Blowers

Where the use of one of the Highways Agency’s snow blowers is required the Regional Winter Service Coordinator, [name], will be contacted and approval sought. Where the equipment is to be brought in from another area the Regional Winter Service Coordinator will liaise, as necessary, with the National Winter Service Coordinator and other relevant parties.

[Service Provider] has [number?] operatives qualified to operate snow blowers as detailed at Appendix A.6.

Service Provider to include full detailed arrangements and procedures for the use of snow blowers including details of transport arrangements.

3.2 Network Features

The network features listed below are specific to winter operations only. Details of the general network features are located in section 1.6.3.

Snow Gates

The following table should be completed, highlighting the location and type of snow gates that exist on the network. Details of operation and maintenance of these facilities should be included in section 3.1.3.1 and appropriate cross-references included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

Snow Fences

The following table should be completed, highlighting the location and type of snow fences that exist on the network. Details of maintenance of these facilities should be included in section 3.1.3.1 and appropriate cross-references included. Where none exist a positive statement to that effect should be included here.

The procedures for reviewing the locations and effectiveness of existing fencing and for identifying new locations should also be described.

Road	Location	Type
[A999]		

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3.3 Resources

3.3.1 Vehicles and Plant

3.3.1.1 Available Resources

A detailed schedule of vehicles and plant including operational spreaders, ploughs, loading shovels, [snow blowers] and reserve vehicles can be found in Appendix A.5.

Service Provider to include other vehicles and plant as appropriate.

3.3.1.2 Reserve Vehicle Arrangements

[Service Provider] can use the reserve fleet allocated to their Area without prior approval but must ensure the use is notified up to an agreed predetermined level. Details of the agreed national procedures for management of the reserve vehicles are detailed in AMM 81/06 and Appendix A15 – Deployment of Reserve Winter Service Vehicles.

Service Provider to include detailed local arrangements and procedures for the use of reserve vehicles including details of arrangements for transporting vehicles between areas.

3.3.1.3 Vehicle Maintenance Arrangements

Service Provider to include details of vehicle maintenance arrangements for both Service Provider and Highways Agency vehicles. Arrangements should detail who provides maintenance services, how these services are managed and call out procedures with appropriate references to the internal and external contact lists.

Arrangements for recording and reporting defects to be included here.

3.3.1.4 Arrangements for “Specialist” Equipment

Service Provider to include details for specialist equipment as appropriate e.g. specialist mixing equipment for alternative de-icing materials.

Service Provider to detail any other equipment such as loading hoppers and weighbridges including arrangements for maintenance.

3.3.1.5 Arrangements with supply chain partners

Service Provider to include details of any supply chain partner arrangements.

3.3.2 De-icing Materials

3.3.2.1 Type and Specification

- **6mm salt, to BS3247:1991.**
- **Abrasives: 5 or 6mm sharp sand**

Additional specialist materials such urea, acetate salts, glycol, brine, ABP, etc should be specified where applicable.

3.3.2.2 Storage Locations

Service Provider to include details of storage locations and facilities. A reference to Appendix A.7 should be included. Where defined supply profiles are used, these should be included. Service Provider to copy this table as required for each material used.

De-icing Material (i.e. Dry salt/ABP)	Location	Type (barn/open)	Max (tonnes)	Min (tonnes)

3.3.2.3 Brine Production and Storage

Service Provider to include details of brine production and storage facilities where used.

Location	Type (saturator/storage only)	Capacity (L)	Min (L)

3.3.2.4 Supply Arrangements

Service Provider to include details of supply arrangements including a primary and secondary supplier. Detailed evidence must be given to confirm salt can be sourced in a timely manner. Details of monitoring and stock control arrangements must also be documented.

3.3.2.5 Reserve and Contingency Arrangements

Service Provider to include details of reserve arrangements. Details of contingency supply should also be specified including details of alternative suppliers and mutual aid arrangements with other Service Providers or local highway authorities.

3.3.2.6 Monitoring and Reporting

[Service Provider] must monitor salt stocks (and stocks of other appropriate materials) regularly during the winter period and reports made using the WRF1 electronic reporting system. When making these reports [Service Provider] must take into consideration information contained within [AMM 76/06 or the Network Management Manual *as appropriate*] a copy of which is attached at Appendix A.10.

Attention is drawn to amendments to AMM 76/06, AMM 63/05, AMM 91/07 and the NMM which will be issued in July and August 2009. The amendments will include a requirement that the Service Provider must provide evidence to justify how each salt threshold level has been set. The reporting threshold definition will be the threshold for the automatic ordering of additional salt. Service Providers will be asked to confirm salt stock profile for every month of the winter season, as opposed to a small number of key dates as previously provided.

3.4 Footways and Cycle Tracks

3.4.1 Introduction

Service Provider to include area specific introduction as appropriate.

3.4.2 Policy

3.4.2.1 Footways Response and Treatment Times

The service and performance requirements for footway and cycle track treatments are defined within [AMM 50/04 or the Network Management Manual *as appropriate*] a copy of which is attached at Appendix A.10.

The treatment of footways and cycle tracks should normally be co-ordinated with adjacent local highway authorities. Service Provider to include specific details of treatment policy.

3.4.3 Routes

Details of all routes to be treated are contained in 1.6.2

3.4.4 Operations

Service Provider to include details for the treatment of footways, cycle tracks and paved pedestrian areas where appropriate.

Service Provider to include details of the spreading technique(s) for footways, cycle tracks and paved pedestrian areas.

3.4.5 Resources

Service Provider to include details of resources to be utilised in the treatment of footways and cycle tracks.

4 SEVERE WEATHER

4.1 Operations

This section of the severe weather plan contains [Service Provider's] detailed operational procedures and actions in the event of severe weather on the [Area No/Route DBFO] network and includes arrangements for liaison and co-operation with adjacent providers to promote delivery of a consistent and co-ordinated service across all boundaries. The Highways Agency's NTCC and RCC service are responsible for arranging both strategic and tactical diversion routes and media liaison. The Service Provider is to include operational activities as detailed in the red text below.

Service Provider to include area specific introduction as appropriate, including reference to the 'Service Provider Contingency Plan' and escalation procedures in the event of severe weather. Reference to section 2.1.6 Escalation can be made if appropriate.

Service Provider to include operational considerations for each severe weather type as appropriate e.g. treatment of special structures, treatment during peak traffic flow periods, road works, treatment within tunnels, road over road bridges, operations near railways and innovative trials. Full details should also be included in the route schedule (Appendix A.4) and a cross reference included within this section.

Service Provider to make reference to any additional operational plans (i.e. M48 Severn Crossing) specific to dealing with severe weather.

4.1.1 Early Warning/Forecasts

Service Provider to detail what alerts/forecasts they will use to provide early warning of forecast severe weather (i.e. EA Flood Watch/Warning, weather forecast etc)

4.1.2 High Winds/Gales

4.1.2.1 Operation Considerations

Service Provider to include full detailed arrangements and procedures in the event of high winds/gales to include picking up debris, signage, and location of metrological equipment, treatment of the network including footways, cycle tracks and pedestrian areas where appropriate.

4.1.3 Floods

4.1.3.1 Pumping, Jetting & Clearance Techniques and Operational Considerations

Service Provider to include details and procedures for pumping, jetting and clearance techniques.

Service Provider to include any identified areas where floodwater can be pumped too.

Service Provider to include details for the treatment of carriageway, footways, cycle tracks and pedestrian areas where appropriate.

Service Provider to include operational considerations as appropriate e.g. maintenance of drainage systems liable to flooding and operations near railways.

4.1.3.2 After care and follow up treatments

Service Provider to include details for treatment to the network including footways, cycle tracks and pedestrian areas where appropriate.

4.1.3.3 Arrangements for use of Pumping and Jetting equipment

Service Provider to include full detailed arrangements and procedures for the use of pumping and jetting equipment.

4.1.4 Fog

4.1.4.1 Hazard Mitigation

Specific measures that should be considered by the Service Provider include:

- Where available fixed or mobile Variable Message Signs should be used to warn road users of the hazard. The existing established procedures for requesting VMS settings to be made should be followed well in advance. The following legend is currently the most appropriate to use – ‘FOG SLOW DOWN’. This will require arrangements and protocols to be established with the appropriate RCC.
- National Incident Liaison Officer (NILO) and/or Highways Agency Press Officer should be contacted in order that the local media can be advised as necessary.
- Where available use of variable mandatory speed limits should be considered. This will require arrangements and protocols to be established with the appropriate Police Control office or RCC as part of the advance planning procedures.

Service Provider to include area specific introduction and list the procedures in place for warning motorists (i.e. use of fog detection systems if available, signage)

4.1.5 Heat wave

In the event of a heat wave where vehicles and occupants are static on the motorways and trunk roads for a long periods of time, the Service Provider shall provide support and assistance to the RCC and the Police as requested.

Service Provider to include details and procedures for the treatment of melted asphalted carriageway surfaces including bridge decks

4.2 Network Features

The network features listed below are specific to severe weather operations only. Details of the general network features are located in section 1.6.3.

4.2.1 Rivers, Streams and Brooks

The following table should be completed, highlighting the location of rivers, tributaries and flood plains which historically have caused flooding on the network. Details of water courses and areas subject to flooding from seepage of water onto the carriageway from adjacent land should also be included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

4.2.2 Coastal Defence

The following table should be completed, highlighting the location of coastal areas that exist on the network subject to flooding. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

4.2.3 Bridges, Open Areas and Forest Areas

The following table should be completed, highlighting the location of forests and areas of trees most susceptible to high winds that exist on the network. Details of bridges and open areas subject to strong cross winds should also be included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

4.3 Resources

4.3.1 Vehicles and Plant

4.3.1.1 Available Resources

A detailed schedule of vehicles and plant including pumps and jetting equipment can be found in Appendix A.5.

Service Provider to include details for any other equipment and specialist equipment as appropriate including arrangements for maintenance.

4.3.1.2 Vehicle Maintenance Arrangements

Service Provider to include details of vehicle maintenance arrangements for both Service Provider and Highways Agency vehicles. Arrangements should detail who provides maintenance services, how these services are managed and call out procedures with appropriate references to the internal and external contact lists.

Arrangements for recording and reporting defects to be included here.

4.3.1.3 Arrangements for "Specialist" Equipment

Details of "specialist" plant and equipment available for use in severe weather conditions are contained in Appendix A.5.

APPENDICES & SCHEDULES

NOTE : To reduce the size of the Severe Weather Plan, the Service Provider may include certain appendices within a box of reference and not append these directly to the plan. Where this is applicable a note has been added at the start of the appendix. The Service Provider must agree an acceptable approach with the Area Performance Team and confirm the location of the box of reference.

A.1 Definitions and Abbreviations

Major or Critical Incident	See 'Service Provider Contingency Plan' Appendix C and Appendix D
Severe Weather Desk	
AMM	Area Management Memo
Service Manager	Area Manager, Service Manager or DR
Service Provider	MA, TMC, MAC, DBFO Co
Mutual Aid	Where one service provider may have a resource issue, a second or third (etc) service provider will assist in delivering the same goal
Collaboration	Two (or more) service providers working jointly to achieve the same results.
Sharing	Using a resource jointly with other service providers

Service Provider to complete this list including key definitions of all key terms and abbreviations used.

A.2 Area Map – may be inserted within a box of reference

The area plan should include, as a minimum, the following:

- *Overall extent of the network*
- *LHA boundaries*
- *Details of adjoining networks*
- *Police authority boundaries*
- *Treatment routes*
- *Weather forecast domains*
- *Ice Prediction outstations*
- *Compounds and Depots*
- *Network features (snow gates, emergency crossovers, snow fences, vertical concrete barriers, rivers, streams and brooks, costal defences, bridges, open areas and forest areas)*

In addition, consideration should be given to including the following information:

- *Topographical features such a height and areas of dense population*
- *Location of contingency supply facilities (plant, salt, fuel etc.)*

The plan should be to a scale, and of a size, to allow the above information to be displayed.

Separate maps should be included within this appendix to detail footway and cycle track treatments.

A.3 Interface Drawings – *may be inserted within a box of reference*

Standard Highways Agency interface drawings for the Area/Route network to be inserted here.

A.4 Route Drawings & Schedules – may be inserted within a box of reference

Service Provider to include route details, including unique reference, length, treatment time, salt usage, vehicle, base, instructions and inclusions/exclusions. A sample route schedule is shown below:

[Area No / Route DBFO] Winter Service Route Schedule (2004/2005)					
Route Number		Route Description			
Base Compound		Vehicle Type			
Salt Usage (@ 20gm ²)		tonnes	Vehicle VRN		
Treatment Time		hrs:mins	Vehicle Capacity		m ³
Special Route Features					
Part	Description (inclusions/exclusions and other special considerations)	Action (Travel/Salt)	Distance (Travel)	Distance (Treat)	Distance (Cumulative)
1					
2					
3					
4					
5					
TOTALS					

Description column must include full and specific details of individual exclusions and inclusions such as lay-bys.

Service Provider should, where appropriate, include special 'snow ploughing', extra effort routes or supplementary high level routes.

Service Provider should include details for local problem areas or areas requiring special consideration due to e.g. different surfacing types

Where appropriate, separate 'route cards' giving more detailed instructions to drivers should be prepared and included within this appendix.

A.5 Vehicles and Plant Schedule

Service Provider to include spreaders, ploughs, loading shovels, snow blowers, pumps, jetting equipment, sweepers and other specialist plant for use in both winter and sever weather conditions. A sample Vehicle and Plant schedule is shown below:

Operational Vehicle Schedule						
Owner	Location	Type	Capacity	VRN or ID	Plough No	Route
[HA/SP]	[name]	[type of vehicle]	[m ³ for spreaders]	[VRN of Identification Number]		[route reference]

Reserve Vehicle Schedule					
Owner	Location	Type	Capacity	VRN or ID	Plough No
[HA/SP]	[name]	[type of vehicle]	[m ³ for spreaders]	[VRN of Identification Number]	

A.6 Operatives Schedule – may be inserted within a box of reference

Operative Schedule					
Base	Name	Winter NVQ Number	NVQ Expiry	Licence No	NVQ Coverage
[base location]	[name]	[reference]	[date]	[reference]	[H/P/S]

Key to NVQ Coverage:

- H Qualified to operate Highways Agency spreaders
- P Qualified to operate Provider Spreaders
- S Qualified to operate Highways Agency Snow Blowers

A.7 Compounds, Depots and Facilities Schedule – *may be inserted within a box of reference*

Service Provider to include all compounds, depots and other facilities and should include full postal address, contact details, and facilities available e.g. salt storage, loading hoppers, fuel storage, back up power supply, communications, garaging, workshops, welfare, etc). A sample compounds and depots schedule is shown below:

Compounds, Depots and Facilities Schedule						
Compound , Depot or Facility Name	Owner	Postal Address	Purpose	Access Arrangements	Contact Details	Facilities
[name]	[HA/SP]	[address]	[description of purpose]	[details]	[telephone, fax and radio call sign]	[comprehensive list]

A.8 Internal Contact List

Service Provider to include contact information for the key personnel within the organisation.

A.9 External Contact List

Service Provider to include contact information for the Highways Agency (Area team, press officers, HAIL), police, adjacent Service Providers (MA, MAC, DBFO), adjacent local highway authorities, weather forecast provider, RWIS Service Provider and others. A sample external contact list is shown below:

Name	Role	Organisation	Telephone	Fax	Email
[name]	Service Manager	Highways Agency			
[name]	Regional Winter Service Coordinator	Highways Agency			
John Wainwright	National Winter Service Coordinator	Highways Agency			
Highways Agency press officers		Highways Agency			
HAIL		Highways Agency			
NTCC		Highways Agency			
RCC ([Region])					
RCC ([Region])					
[name]	Weather Forecaster	[organisation]			
[name]	RWIS Bureau Service Contractor	[organisation]			
[name]	RWIS Outstation O&M Contractor	[organisation]			
[name]	Salt supplier	[organisation]			
[name]	Vehicle Maintenance Contractor	[organisation]			

Service Providers must populate the above contact list with details of all adjacent Service Providers, local highway authorities, police authorities, supply chain organisations, and other relevant stakeholders.

A.10 Reference Documents – *may be inserted within a box of reference*

- 1 Trunk Road Maintenance Manual *as appropriate*
- 2 Circular ROADS 18/77 - Railways
- 3 Network Management Manual *as appropriate*
- 4 Routine & Winter Service Code *as appropriate*
- 5 [Area] Contingency Plan
- 6 AMM 34/02 Winter Maintenance in Low Temperatures Combined with Low Humidity Conditions*
- 7 AMM 35/02 De-icing and Snow Clearance within Traffic Calmed Areas
- 8 AMM 36/02 Winter Maintenance of Thin Wearing Courses
- 9 AMM 41/03 Winter Maintenance Operations
- 10 AMM 50/04 Winter Service for Footways and Cycleways
- 11 AMM 51/04 Mutual Aid Arrangements*
- 12 AMM 57/05 Post Incident De-briefing Arrangements – Guidance Document
- 13 AMM 62/05 Guidance on dealing with Freezing Rain*
- 14 AMM 63/05 Salt Stock Level Monitoring*
- 15 AMM 65/05 Winter Notification and Winter Reporting Arrangements 2005/06
- 16 AMM 69/06 - Snow Plough Height Settings
- 17 AMM 76/06 Strategic Salt Supply Monitoring*
- 19 AMM 81/06 Deployment of Reserve Winter Service Vehicles*
- 20 AMM 89/07 Snow Clearance Adjacent to Solid Vertical Barriers
- 21 AMM 91/07 Winter and Business Continuity Reporting Arrangements*
- 22 AMM 93/07 Salt Loading Hoppers
- 23 AMM 102/08 Winter Service and Severe Weather Briefings*
- 24 AMM 103/08 Snow Desk Exercises*
- 25 Area/Route Specific Contract Documents

Note that the inclusion of the TRMM and the above AMMs will be as appropriate to the inclusion of the Routine & Winter Service Code and Network Management Manual

** Further guidance will be issued in these areas which will supersede the existing AMM. The existing reference number is listed here for consistency*

A.11 Standard Forms – *may be inserted within a box of reference*

This appendix includes the following standard forms:

- i. Notification of Proposed Treatments
- ii. Daily Operational Update
- iii. Hourly Operational Update

The forms should only be used where the WRF1 system has not been used for reporting.

[Service Provider name and logo]	[Service Provider address line 1] [Service Provider address line 2] [Service Provider address line 3] [Service Provider address line 4] [Service Provider telephone] [Service Provider fax] [Service Provider email]
----------------------------------	--

Distribution List
[name, organisation, fax number/email]

NOTIFICATION OF PROPOSED TREATMENTS for [Area/DBFO Route]				
For the 24 hour period started at 12:00 hrs on				
Minimum Air Temperature	Minimum RST	Time RST zero		
Winter Maintenance Action Required:	YES		NO	
Proposed Treatment				
Route No	Route Description	Spread Rate (g/m ²)	Start Time	Comments
Additional Comments				
Actioned by:		Verified by:		
Date & Time:		Date & Time:		

<p>[Service Provider name and logo]</p>	<p>[Service Provider address line 1] [Service Provider address line 2] [Service Provider address line 3] [Service Provider address line 4] [Service Provider telephone] [Service Provider fax] [Service Provider email]</p>
---	---

To

[Highways Agency Service Manager]

DAILY OPERATIONAL REPORT
 for [Area/DBFO Route]

For the 24 hour period started at 12:00 hrs on

Operational Summary							
Route No	Proposed Treatment			Actual Treatment			Comments
	Spread Rate (g/m ²)	Start Time	Finish Time	Spread Rate (g/m ²)	Start Time	Finish Time	

Additional Comments

Recorded by:

<p>[Service Provider name and logo]</p>	<p>[Service Provider address line 1] [Service Provider address line 2] [Service Provider address line 3] [Service Provider address line 4] [Service Provider telephone] [Service Provider fax] [Service Provider email]</p>
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<p>To</p>
<p>[Highways Agency Service Manager]</p>

<p align="center">HOURLY OPERATIONAL UPDATE for [Area/DBFO Route]</p>		
Date	Time	
<p>Network Summary</p>		
<p> </p>		
Network Status Summary		
Road No	Condition	Ongoing Operations
<p>Operational Report</p>		
<p>Recorded by:</p>	<p> </p>	

A.12 Decision Maker Duty Rota

A.13 Severe Weather Desk Duty Rota

A.14 Training Records – *may be inserted within a box of reference*

A.15 Deployment of Reserve Winter Service Vehicles

1. Service Providers may use 100% of the reserve spreaders allocated to their area to cover for breakdowns or extra effort without approval from the HA.
2. Service Providers must record the issue of each reserve vehicle on the WRF1 Winter and Business Reporting System in accordance with AMM 91/07 (Near to Real-time – within 30 minutes). In severe weather, it is important that Service Providers keep the WRF1 reporting system updated.
3. Reserve spreaders are also available to DBFO Cos but must be operated by drivers that have received the certified training. When required, a DBFO Co should arrange with the appropriate Service Provider to obtain the vehicle. If the DBFO Co is unable to secure a reserve vehicle, contact should be made with the National Winter Co-ordinator. The issuing Service Provider is responsible for recording the issue on the WRF1 system.
4. Reserves that are no longer needed must be returned to their operational centre and the WRF1 reporting system updated accordingly. Reserves are issued for specific tasks and may be withdrawn for re-deployment elsewhere should the need be greater.
5. The National Incident Liaison Officer (NILO) will monitor the issue of the reserve HA Salt Spreaders nationally using the WRF1 Winter and Business Continuity Reporting System.
6. Amber Alert - For the purposes of reserve fleet management, an amber alert is activated when any areas threshold level is reached (as agreed between the service provider and Area Performance Manager).
7. Red Alert - a red alert is reached when either 50% of a division’s reserve or 100% of a region’s reserve is utilised.
8. The numbers of HA reserve spreaders and the agreed amber and red alert trigger levels specific to the area, region and division must be recorded in the following table.

	Area X	XY Region	Z Division
Number of HA Reserve Spreaders	Enter No	Enter No	Enter No
Amber Alert – Number utilised	Enter No	N/A	N/A
Red Alert – Number utilised	Enter No	Enter No	Enter No

9. Network Performance Managers (NPMs) will be responsible for a whole division on an on-call basis and may utilise any of the Division’s reserve fleet anywhere within that Division (some divisions may vary).
10. The NILO will advise the NPM and National Winter Co-ordinator when the situation becomes amber. For amber alerts, contact will not be required outside normal working hours.
11. For amber alerts, the National Winter Co-ordinator may contact the NPM to discuss the deployment of reserve fleet if he considers the situation needs elevating. This will be a pragmatic view.

12. The NILO will advise the NPM and National Winter Co-ordinator when the situation reaches red alert. If out of hours, contact will be made with the NPM and National Winter Co-ordinator on-call.
13. For red alerts, the National Winter Co-ordinator will contact the service provider to discuss the use of reserves. The National Winter Co-ordinator will then contact the NPM to discuss the deployment of the reserve fleet and any requests to deploy additional vehicles. The NPM will be requested to sanction further deployment of fleet, based on advice from the National Winter Co-ordinator taking account of the reason for reserve usage, the current road/weather conditions and the weather forecast.
14. Only if the NPM and National Winter Co-ordinator consider the situation to be a 'critical incident' will the Senior Officer on-Call (SOoC) be contacted by the NPM. The SOoC can then decide whether to call into action the National Crisis Management Team. It may be that the SOoC decides that it is a 'critical incident' irrespective of the reserve fleet utilisation.
15. The Service Provider will be responsible for the deployment of snow blowers within their area. When deployed the NPM and National Winter Co-ordinator will be notified in normal working hours only.

A.16 Solid Vertical Barrier Schedule and Clearance Plan – may be inserted within a box of reference

Solid Vertical Barrier Location Schedule

Solid Vertical Barrier Reference Number: [Reference to network map]	
Location	[Location in relation to: marker posts for Motorways/ relevant landmarks for APTR]
Cross Sectional Position	[Location in Verge or Central Reserve]
Distance from Adjacent Running Lane	[Distance from Barrier to nearest running lane]
Construction of Adjacent Verge	[Grass / Hardened / Filter Drain / V-Channel etc.]
Number of Running Lanes	[Number of Running Lanes adjacent to barrier]
Hard Shoulder Details	[Details of any hard shoulder present – Width, any other features]
Slip Roads Present	[Details of any diverging/merging slip roads present at the location]
Large Hatching Areas	[Details of any large hatching areas present - for example near diverge/merge tapers]
Resources Required for Echelon Ploughing	[Resources required for echelon ploughing including any plant required for bulk clearance]
VMS Available	[Details of VMS present - Mobile VMS required or barrier in location with permanent VMS]
Additional Non-Dedicated Vehicles	[Details of non-dedicated vehicles that will assist in clearance]
Assistance from External Sources	[Details of assistance required from such entities as Traffic Officers, Police, RCCs etc.]

Annex 5.3.1 Thermal Mapping Specification (Ref. no HM-TM1 1988)**i. Introduction**

The Service Manager encourages the Service Provider to install ice prediction systems as an aid to improve forecasts of road conditions, leading to a more cost effective winter maintenance service. Specification number TR2020C and TR2013A describes how such systems operate in the interests of a National Ice Prediction.

The following specification details the parameters to which companies offering thermal mapping services are required to operate, the weather conditions under which they should be carried out, and the format in which the results should be presented to the Service Provider. The Service Provider should ensure that firms appointed to carry out thermal mapping do so in accordance with this specification.

ii. Definitions

Minimum Road Surface Temperature: The lowest temperature reached by the road surface at a given point during the night. (The minimum road surface temperature normally occurs at about the time of sunrise).

Route Survey: The observation and recording of all spatial and other factors on an adjacent carriageway that can significantly affect minimum road surface temperature. (e.g. Road construction, emissivity, orientation, slope, embankments, cuttings, trees, etc).

Thermal Survey: The measurement and recording of spatial variations of road surface temperature using passive infra-red sensors.

Thermal Map: The representation on a road map (typically at a scale of approximately 1:50,000) of the spatial variations of minimum night-time road surface temperature.

Thermal Mapping: The process of producing a thermal map. This includes the measurement of road surface temperatures, the application of any corrections required to calculate road surface temperatures at a particular reference time and the presentation of the results.

Reference Time: A single time to which observations from a thermal survey are corrected, so eliminating the influence of temporal changes in road surface temperature when surveys take a significant length of time.

iii. Applications of Thermal Maps

Road surface temperature varies in both space and time. It is dependent on certain fixed factors such as altitude, topography, road construction and sky-view factor and on variable factors such as traffic density and weather conditions. This way these factors control road surface temperature is described later in this Annex. Thermal maps, which depict the spatial variations in minimum road surface temperature, have several applications which include either:

(a) identification of those points on the road at which road surface sensors should be installed to provide the most complete and representative information on road surface conditions possible with a small number of sensors; or

(b) indication, for particular weather conditions, of how the minimum road surface temperatures at all mapped points on the Network are related to the minimum road surface temperature at those points where measurements and/or forecasts are available.

iv. Specification**Thermal Surveys**

(a) Thermal surveys must be carried out between midnight and sunrise during the months November to March. Outside these periods i.e. between sunrise and midnight during the winter

months and at any time between April and October variations in roads surface temperature depend more on traffic density and the receipt of solar radiation during the day, than on the loss of terrestrial radiation at night.

- (b) Each survey must be labelled with the date and time.
- (c) The resolution of recorded road surface temperature data must be 0.1 °C or better and the accuracy must be ± 1 °C as demonstrated in calibration checks. This accuracy must be maintained over the full operational range of the equipment used for the thermal survey.
- (d) The average road surface temperature for a given run must not be greater than plus 0.5 °C.
- (e) Measurements of road surface temperature must be made at least every 20 metres along the road, although it may be necessary to take closer readings (every 5 metres, say) in areas where sensor locations are being identified. Actual siting of sensors will be restricted by the availability of power and telephone services. Where possible sites must be chosen so that vandalism of roadside equipment is unlikely.
- (f) The value of emissivity of the road surface used to derive each road surface temperature must be recorded.
- (g) The state of the road surface at the time of the thermal survey must be recorded (i.e. dry, wet, frost, ice or salt).
- (h) For each thermal survey a detailed description of the prevailing weather conditions must be provided. This must include:
- (i) Cloud type, amount and cloud base height (low, medium or high). This information may be obtained from the Forecast Provider;
 - (ii) Wind speed and direction. Actual height at which the wind is measured to be stated. Measurements to be corrected to a height of 2 metres using Table A5.3.1
 - (iii) Air temperature (at a height of 1.25 m);
 - (iv) Dew point temperature (at a height 1.25 m).

Table A5.3.1 Wind Speed Correction Factors

Height of wind observation (m)	Multiplying factor to be used to obtain wind at 2 m height	
	cloudy and/or windy	clear, very light winds
1	1.2	1.3
3	0.9	0.9
5	0.5	0.5

The above measurements must be made at a point representative of the area of the survey and at the start and end of the survey. The forecasting organisation may be asked to provide supplementary weather details from the nearest weather station. Conditions must be recorded at least hourly. The description must also include text describing changes in weather conditions along the route which are not adequately defined by the above information.

When ground based thermal surveying techniques are used, surveys of both sides of a dual carriageway are not normally necessary but must be done if the two carriageways diverge significantly or differ in construction, as in the case of an 'old' road forming one carriageway of a dual carriageway. Where there is more than one lane, data is ideally required for the right-hand lane which is normally colder. However, as no vehicle must run continuously in the right-hand lane,

measurements must be taken in the centre lane of a 3 lane carriageway or the left-hand lane of a 2 lane carriageway. Sample runs in the right-hand lane must be made to establish the relationship. The police must be informed if surveying is likely to cause problems for traffic. Aerial surveys automatically include both carriageways plus hard shoulders, verges and adjoining land.

Survey times must not be greater than one hour, preferably less. However, if a thermal survey lasts more than 1 hour it is essential to survey parts of the route(s) twice to quantify changes in the road surface temperature with time, to enable all temperatures to be adjusted to a common reference time, preferably around the time of minimum road surface temperature.

v. Route Surveys

The route survey must provide the following information:

- (a) Reference to the Service Provider's Section Referencing system and to other major features such as bridges and main interchanges;
- (b) Changes in road surface type with reference points (e.g. black top, concrete or elevated);
- (c) Presence or absence of trees, hedges, buildings, cuttings and embankments (if they dominate or have influence upon the road surface temperature).

Note: All the above must be identified within the Service Providers Section Referencing system.

vi. Weather Conditions for Thermal Surveys

Thermal surveys may be required in any of the following conditions:

- (a) Calm and clear: wind speed less than 6 knots at 2 metres height, with negligible amounts of low and medium cloud
- (b) Windy and cloudy: wind speed more than 6 knots at 2 metres height, thick low cloud;
- (c) Intermediate conditions: surveys here will require individual analysis but can be helpful to show the sort of variations which occur between the two extremes covered by (a) and (b). Particular care is required for non-uniform cloud situations as the cloud will be a significant factor. Preference must be given to windy and clear conditions or to calm and cloudy conditions, if possible.

The number of thermal surveys required and the weather conditions in which they must be carried out depends on the use to be made of the resultant thermal maps. If the thermal map is to be used only for sensor site selection, a single thermal survey made in calm and clear conditions may suffice, but this is a minimum requirement. One single run, even under clear calm conditions, will not necessarily give a representative thermal map, although one airborne survey will provide rapid synoptic imaging with high spatial resolution along an entire route corridor.

If a thermal map is required as an aid to the prediction of road surface temperature and the management of winter maintenance, a series of thermal surveys (usually 5) must be made under different weather conditions. The Service Provider must consult its local forecasting organisation to advise on how many runs are required. (e.g. Extra surveys may be required for different wind directions where there are important local influences like conurbations or coasts and hills).

vii. Results in Digital Form

For each survey, the results of all runs carried out are to be provided in digital form as shown in Table A5.3.2

The following information must be given at maximum intervals of 20 metres:

- (a) Position along road (in metres from CHART nodes);
- (b) Emissivity used to correct observations to road surface temperature, to 0.5%;
- (c) Temperature (°C), recorded with a resolution of 0.2°C;
- (d) Corrected temperature (°C), also to 0.2°C, at a common reference time, after correction to account for the duration of the survey;
- (e) Two further temperatures, (as required, referring to right-hand lane as (a) to (d)).

This data must be preceded by a file giving date, time and position relative to the Service Provider's reference points at the start and end of the survey. When a survey involves an out and back or circuitous traverse, this information must also be given for the turning points of the traverse. The file must also include the survey reference point, the reference time to which the temperature measurements are corrected, and whether temperature data are given for both right-hand and left-hand lanes of the road (right-hand and middle lanes for a 3 lane carriageway). The file must also contain a detailed description of the prevailing weather conditions at the start and end of the survey and, for long surveys at intermediate hours.

viii. Tabular Data

The data from the route survey must be given as specified in v above. For each survey, a detailed description of the prevailing weather conditions must be provided, as detailed in iv above.

ix. Results in Pictorial Form

The digital data, corrected to the survey reference time, must be used to show the variation of temperature along the survey route in graphical form for each survey.

In addition, composite maps constructed from the individual survey must be provided. These must be drawn for each of the weather conditions in section (vi). However, only one, depicting the first of the extremes, is required when thermal mapping is being done purely for sensor site selection.

All map data must be at a scale of 1:50,000.

Colours representing 1°C temperature bands must be used to identify variations in temperature on maps. The colour coding must be clearly stated: it is recommended that the colours used must be from the sequence (coldest temperature first) blue, green, yellow, orange, red, with a further subdivision of dark and light blue and green when wide variations of temperature are encountered. The horizontal resolution must be 50 metres, or as otherwise specified.

x. Explanatory Text

The maps must be accompanied by text explaining the variations of temperature along the routes, with long-sections provided to amplify the text. Further interpretation is required, giving areas which the surveys have shown to possess similar thermal climates and groupings of routes with similar temperature profiles.

Table A5.3.2 Format of Digital Data

Item No	Description	Character format
1	Route description, including location references at start and end of survey, and at intermediate points on the route. Place of measurement of air temperature, wind speed, cloud.	up to 1024 ch. in length
2	Survey date (DDMMYY)	I6
3	Start time (GMT) (HHMM)	I4

Item No	Description	Character format
4	End time of survey (GMT) (HHMM)	I4
5	Height of dry bulb and dew point measurements (m)	F4.2
6	Height of wind speed measurement (m)	F5.1
7	Start air temperature °C)	F5.1
8	Start dew point temperature °C)	F5.1
9	Start cloud cover (0-8), cloud type+ and cloud base height (ft)	3(I1, Char, I5)
10	Start wind speed (knots), as measured, and corrected to 2 m height, and direction	2 I2 Char*3
11	End air temperature, dew point, cloud, wind speeds and direction	2F5.1, 3(I1, Char, I5), 2I2, Char*3
12	Number of intermediate (hourly) meteorological observations	I1
13	Start time of intermediate meteorological observations (HHMM)	I4
14-37	Hourly intermediate observations as 7-10 above	2F5.1, 3(I1, Char, I5), 2I2, Char*3
38	Reference point (8 figure National Grid Reference (NGR)) from which survey distances are measured	I8
39	Reference time to which survey temperatures are corrected (HHMM)	I4
40	Indicator for lane carriageway. 1. middle/left-hand lane only; 2. right-hand and middle/left-hand lane surveyed	I1
41-??	Time (HHMM, every kilometre); Distance (in m); Emissivity used to correct observations to RST (%); Road temperature °C) to 0.□ °C; Estimated temperature at reference time after correction to allow for survey duration; 2 optional further temperatures if right-hand lane data are also available	(I4,I6,5F5.1)
Note: + L = low cloud (base <8000 ft); M = medium cloud (base 8000-20000 ft); H = high cloud (base > 20000 ft)		

xi. General Notes on the Results

The number of copies of maps, 'fingerprints', drawings, reports etc must be supplied in accordance with the Service Provider's requirements.

When the Service Provider has requested advice concerning the location of sensors, a list of representative sites must be produced, ranked in order of priority. This will enable a final selection to be made, also taking into account other factors such as the availability of power and telephone lines and security considerations.

The information provided in vii to ix above must be sufficient to enable ice prediction systems to be designed and implemented.

Factors Controlling Road Surface Temperature

i. Introduction

The surface temperature of a road is determined by its construction, its location, its surroundings, the traffic it carries, the weather (particularly the air temperature) and the time of day and season. This section describes how these factors exert their influence on road surface temperature.

ii. Temporal (diurnal) Variations in Road Surface Temperature

Road temperature is determined by heat exchanges between its surface and its surroundings. Generally the surface of the road gains heat by absorbing short-wave radiation from the sun and sky and long-wave radiation from the sky, clouds, buildings, trees, etc. The road surface loses heat by radiating long-wave radiation both day and night at a rate depending on its temperature. It also exchanges heat with the body of the road at a rate which depends on road construction and core temperature. Normally the radiation exchange results in a net gain of heat during the day and a net loss of heat during the night. The road surface also exchanges heat, by conduction and convection, with air in contact with it. The rate of this heat exchange depends on the temperature difference between the road and the air, the wind speed, the humidity and the road wetness.

The heat exchanges result in a diurnal regime of road surface temperature in which the maximum normally occurs in the early afternoon and the minimum usually around dawn. Immediately after sunset road surface temperature falls rapidly, but this decline levels off so that during the latter part of a winter night, road surface temperature falls at a lower rate. After sunrise it usually increases rapidly and this increase is often aided by increasing traffic flow.

The diurnal variation of road surface temperature at any point is affected by weather and traffic which influence the time of maximum and minimum temperature and also the amplitude of the diurnal change.

iii. Altitude and Topography

Normally the lower part of the atmosphere is kept well mixed by the wind, and air temperature falls with height at an average 'lapse rate' of about 6.5 °C per 1000 metres. On windy and cloudy nights, road temperature is very similar to the temperature of the air near its surface, and the lowest road surface temperatures are found on the highest hills.

However, on calm and clear nights the exchange of heat between the road and the air is much less efficient, and the road surface temperature can fall several degrees below that of the air above it. The lowest road temperatures then usually occur in the places where the wind is lightest, that is in hollows and valley bottoms. Further, the air temperature in the lowest layer of the atmosphere on these occurrences may increase with height; this is known as an inversion.

In some circumstances, where there is a large variation in altitude, the highest temperature may be experienced in middle altitudes between the cold hill tops and the cold valley bottoms.

iv. Sky-view

An open level road with no adjacent buildings, hedges or trees is fully exposed to radiation from the sun and sky. It can also lose the maximum amount of heat by long-wave radiation to the sky. Radiation loss from the road is reduced by buildings, trees, hedges, cuttings, etc., all of which emit much more radiation towards the road at night than would the portion of the sky that they obscure. Hence, roads in cuttings, under bridges or lined with trees or buildings may stay warmer at night than more exposed roads.

Conversely, such sheltered roads may warm more slowly than exposed roads, if direct solar radiation cannot reach their surfaces in the early morning.

v. Road Construction

Road construction is important because heat is absorbed, stored and released from a road according to its thermal properties. Depth of construction is important too - usually the greater the depth of construction the warmer the road. As a result motorways are normally warmer at night than other roads, and concrete roads are frequently warmer than bituminous roads.

Where a road crosses a bridge, it is likely to be colder due to its shallow construction. However, bridges over water may be less affected as a result of radiation received from the relatively warm water.

vi. Urban Heat Islands

The centre of a large town or city is often several degrees warmer than the surrounding rural areas; this is known as the urban heat island effect. The relatively high temperature in urban areas is the result of industrial, commercial and domestic heat sources within the city allied to the facts that the fabric of the urban environment retains heat to a greater degree than rural areas, and the average sky-view factor for the roads is lower in an urban area.

On nights with light winds, warmer air drifting from an urban area may keep road surface temperature relatively high in the rural area just down wind of a city. Therefore wind direction can be crucial.

vii Traffic

Traffic tends to keep a road warm at night by reducing the sky-view factor, and stirring the air above the road, mixing cold air near the surface with warmer air from above, and so increasing the transfer of heat from the air to the road. Traffic also has a more direct heating effect by transferring heat by conduction to the road from tyres warmed by friction and by radiation from exhausts and engines. Vehicles tend to concentrate in the nearside lane of a road and so inside lanes are generally warmer than outside lanes at night. This phenomenon is most significant on motorways that carry a high volume of traffic at night and temperatures across a carriageway may vary by 1°C or more because of differences in the volume of traffic between lanes. "Peak time" traffic flows can also lead to variations between carriageways.

viii. Weather

Unless a road is provided with an artificial source of heat, weather is the major factor controlling road surface temperature. All other factors modify the effects of the weather on different sections of a road network. When the weather is windy and there is a complete cover of low cloud, variations of road surface temperature across the road network are at a minimum and the road temperature is very similar to the air temperature. However, when the sky is clear and the wind is light, topography, road construction, sky-view factor, traffic and urban heat sources have their greatest effects, and the variations of road surface temperature throughout the road network at their maximum. In these conditions road surface temperature at night may be several degrees lower than the air temperature and during the day it is often more than 1°C higher than the air temperature.

PART 4 – TRAFFIC MANAGEMENT

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4.1 Chapter 8 of the Traffic Signs Manual and Notes for Guidance on 'Safety at Road works'**4.1.1 Introduction**

Chapter 8 of the Traffic Signs Manual (TSM) is the Department for Transport's standard for all aspects of signing and management of traffic at static and mobile road works on the network carried out by the Service Provider. Part 1: Design and Part 2: Operations provide guidance for those responsible for the design and operation of temporary traffic management arrangements.

Chapter 8 also includes guidance on the design and operation of emergency traffic management.

The following Departmental Standards and Advice Notes which form part of the Design Manual for Roads and Bridges (DMRB) are referred to in Chapter 8 (2006):

- (a) TA 11 Traffic surveys by roadside interview (DMRB 5.1.4);
- (b) TA 89 Use of passively safe sign posts to BS EN 12767:2000 (DMRB 8.2.2);
- (c) TA 92 Crossover and changeover design (DMRB 8.4.6);
- (d) TD 9 Highway link design (DMRB 8.4.6);
- (e) TD 19 Requirement for road restraint systems (DMRB 2.2.8)
- (f) TD 22 Layout of grade separated junctions (DMRB 6.2.1);
- (g) TD 27 Cross-sections and headrooms (DMRB 6.1.2);
- (h) TD 69 The location and layout of lay-bys (DMRB 6.3.3)

The Service Provider must take into account the content of Traffic Management and Signing Guidance Notes which are published periodically to supplement/amend TSM Chapter 8 and the associated DMRB Standards and Advice Notes.

Many of the basic principles contained in Chapter 8 are also covered in the Safety at Street Works and Road Works: A Code of Practice, which has legal backing under Sections 65 and 124 of the New Roads and Street Works Act 1991. Guidance is also included in the document 'Guidance for Safer Temporary Traffic Management' (2002) published on behalf of the County Surveyors Society (CSS), the Highways Agency and the Health & Safety Executive. Service Providers must also take the contents of these two documents into account when designing and operating temporary traffic management arrangements.

4.1.2 Implementation

The requirements of TSM Chapter 8 must be taken into account for all works on live motorways and all-purpose trunk roads.

The document makes recommendations based on good practice for the guidance of temporary traffic management designers and operators. It is not a prescriptive specification or a collection of model traffic management layouts. The guidance given cannot cover all situations and it is for the designer to adopt, adapt or develop the required traffic management to suit the actual conditions.

In a situation in which the Service Provider feels that a departure from the Highways Agency's standards is required then the Service Provider must submit details in accordance with the terms of his contract. Authorisation must also be obtained for the use of any non-prescribed signs.

Temporary Traffic Regulation Orders (TTRO) must be used to ban turning movements and enforce lane and carriageway restrictions such as contra-flow working, carriageway closures and speed and vehicle restrictions which are needed to guide and control traffic safely past the works (see TSM Chapter 8, Section D3.37 (Design)). The Service Provider must submit requests for temporary traffic orders on Form TR514, and allow 8 weeks for the preparation and publication of the necessary orders.

All those involved in temporary traffic management operations must be adequately trained.

Workforce issues are dealt with in Section O6 of Chapter 8. Section O6.2 (Operations) deals with training.

4.1.3 Mobile Works

Single Vehicle Works

Advice about single vehicle works is provided in Section O8 of TSM Chapter 8 (Operations). Except for works such as gritting, salting etc. which are undertaken at a controlled speed nearing that of normal road speed, single vehicle works must not be carried out on dual carriageway roads where the national speed limit applies. Instead, works should be carried out by static traffic management, or where appropriate, by use of the Mobile Carriageway Closure (MCC) technique. Single vehicle works should only be carried out on the nearside lane of a carriageway.

When a single vehicle operation is being considered for works which move steadily but at slower speed than normal road operating speeds, there is a need to interpret the underlying principles contained within TSM Chapter 8 in relation to the specific circumstances prevailing at the particular location.

A risk assessment must be produced which takes into account the logistics of setting out and operating the various traffic management options. This assessment should include such factors as the normal traffic speed on the road, the difference between the speed of the works vehicle and normal traffic speed, the alignment / sightlines / width of the road, and the duration of exposure to risk for the operatives.

Where single vehicle works are appropriate, they can be used in conjunction with an impact protection vehicle (IPV). This will afford the additional protection of being highly visible and being equipped with a crash cushion. It should be noted, however, that unless supported by the required level of advance signing, this arrangement does not constitute the provision of a MCC.

Mobile Carriageway Closure

Although the Traffic Officer Service may implement rolling road blocks, for the deployment of emergency traffic management (Section O7.2 of TSM Chapter 8), they do not have a role to create MCC. Guidance on the use of mobile carriageway closures for planned, rather than emergency, works is included in Section O11 of TSM Chapter 8. Specially-signed vehicles are used to create such closures.

4.2 Driver Information Signs at Road works

4.2.1 Introduction

4.2.1.1 A prime objective of the Highways Agency is to provide road users with information that is relevant to their journeys – to have ‘informed travellers’. This chapter directs readers to the Highways Agency’s policy relating to driver information signs at road works that require closure of a lane or hard shoulder. These signs are designed to give drivers advance notice (chronologically and geographically) of future or current road works and to provide information about the works.

4.2.1.2 When investigating traffic management for future road works, consideration should be given to the use of VMS to supplement proposed signing. The Service Provider should contact the NTCC or the relevant RCC to develop any proposals.

4.2.1.3 Signing principles and details of informatory signs are dealt with in Traffic Signs Manual Chapter 8, Section D4 (Design).

4.2.2 General Principles

4.2.2.1 Information signs should be used where the temporary traffic management design identifies that there are likely to be traffic delays of two minutes or greater or there is a need for specific driver information.

4.2.2.2 For major works schemes an information sign located near the beginning and the end of road works should contain the Highways Agency’s logo.

4.2.2.3 Information signs, other than for future road works, should be installed as part of the temporary traffic management arrangement and removed on completion of the works or when no longer required.

4.2.2.4 For signs on adjoining non-Highways Agency roads agreement must be reached with the adjoining local highway authority on the need for the signs, their number, location and costs payable by the Highways Agency.

4.3 Design of Vehicle Recovery at Road works**4.3.1 Introduction**

4.3.1.1 The Highways Agency provides free recovery within many of its major road works sites. The design and operational aspects of vehicle recovery operations are dealt with in Sections D3.35 (Design) and 07.3 (Operations) of TSM Chapter 8. Guidance on the design of Recovery Operations is also included in documents such as the Specification for Highway Works and Guidance for Safer Temporary Traffic Management.

4.3.1.2 The purpose of this document is to provide the Service Manager/Service Provider with comprehensive guidance on the range of issues to be considered and the options available to them when deciding to provide recovery operations within a Highways Agency scheme.

4.3.1.3 This guidance applies to both motorways and all-purpose trunk road parts of the Network.

4.3.2 Why have a recovery service at road works?

4.3.2.2 Whenever works involve a reduction in the amount of carriageway available to traffic, then congestion is more likely to occur and accidents or breakdowns are more likely to result in stationary traffic. Stationary vehicles in the carriageway represent a safety hazard both for the occupants of that vehicle and other road users. Also, by blocking a traffic lane, the traffic capacity at the road works site is further reduced, thereby causing further delays on the network. Hence it is in everyone's interest to remove that vehicle as quickly and safely as possible and in these circumstances it may be appropriate to have recovery arrangements in place to minimise the disruption caused.

4.3.2.3 The provision of a free recovery service should be considered whenever works are likely to involve the following:

- Reduction in the number of lanes available
- Narrow lane widths
- Sections of motorway without hard shoulders
- Hard shoulder running
- Known congestion sites
- Lack of availability of emergency roadside telephones over a significant length of carriageway.

4.3.2.4 Appropriate signing, including "Free Recovery – await rescue" (Diagram 7291), must be used when vehicle recovery is used at road works.

4.3.3 Liaison and Planning Issues

4.3.3.2 Early planning and consideration of the options available is essential to ensure the correct level of service is provided and the cost minimised.

4.3.3.3 The Police and Highways Agency RCC Traffic Officer Service should be involved at an early stage of planning to offer advice on the need for and specification of recovery services appropriate to the particular section of the network affected.

4.3.3.4 The Service Provider/designer should note that local Police forces and the RCC Services currently have their own contracted recovery operators and may be able to provide advice and guidance on the performance and capabilities of local operators.

4.3.3.5 If not involved with the contract already, the Service Provider should be consulted for advice on the proposed locations of recovery stations and setting down points. These should also be checked to ensure they do not conflict with proposed works.

4.3.3.6 Where it is proposed to construct, or site, temporary facilities for recovery operators outside the highway boundary, the Local Authority must be consulted over planning consent issues, waste arrangements and statutory charges.

4.3.3.7 Siting of recovery operations on the local road network (i.e. off the Network) must be discussed with the Local Highway Authority and the Service Provider must obtain written agreement of proposals.

4.3.4 Monitoring of Site

4.3.4.1 In order to achieve rapid removal of broken down vehicles, it is essential that an efficient system be set up to monitor the affected network for broken down vehicles throughout the duration of the works. This is dealt with in Section D3.36 (Design) of TSM Chapter 8. Monitoring of the site can be achieved using one of the following methods:

4.3.4.2 **Closed Circuit Television (CCTV)** – Such systems are relatively expensive to install and maintain but are reliable and allow 24 hour monitoring and recording of the affected part of the Network. CCTV systems can be linked either directly to the recovery contractor's office or else to a dedicated monitoring station provided by the Service Provider.

Monitoring stations must be manned for the duration of any restrictions imposed by the works and must be provided with appropriate communications systems.

4.3.4.3 **Roving patrols** – These require additional recovery or contractors' staff to drive through the works area looking for broken down vehicles and offer a cheaper alternative in terms of set up costs. Once found, the patrol reports the location of broken down vehicles to the recovery base.

Unless roving patrol vehicles are fitted with appropriate impact protection, they must not be used to protect broken down vehicles. [Advice on appropriate impact protection vehicles is given in TSM Chapter 8, Section 05 (Operations).

On larger sites the use of roving patrols can slow the recovery operation when compared with CCTV and hence this system is not recommended for road works where congestion is currently or likely to become a major problem. Costs will be minimised if the decision to provide roving patrols results in the inclusion of this facility in the road works contract at the outset rather than as an addition to a contract.

4.3.4.4 **Watchman** – This is the cheapest of the three systems and relies upon contractors' staff within the site area acting as lookouts for broken down vehicles. This system can be very effective within small sites but has limited value on larger sites. Watchmen can be useful when used in conjunction with roving patrols.

4.3.4.5 The Contractor is to report traffic flow in the road works to the Regional Control Centre. Details on the traffic flow reporting must be agreed prior to the start of the scheduled road works directly between the RCC and the Contractor.

4.3.5 Level of service

4.3.5.1 Having located a broken down vehicle, the level of recovery service employed should be appropriate to the risk of accident and /or scale of congestion likely to develop. The following tried and tested options exist:

4.3.5.2 **Dedicated / On site recovery equipment** – This is the most costly option as the recovery vehicles and staff are based on site permanently for the duration of the works / restrictions. Response times will be dependent upon the size of site and number of bases but are usually quicker than any other arrangement.

4.3.5.3 **Minutemen / Local arrangements** – This system is reliant upon there being locally based recovery services available. The Service Provider must make arrangements with an appropriately accredited local service provider for a priority call-out system. The required service level including response times and minimum equipment levels will be specified by the designer.

4.3.6 Location of dedicated recovery services

4.3.6.1 The choice of location for a recovery base station should normally be left to the contractor unless there are particular safety implications that limit the number of suitable locations.

4.3.6.2 When choosing the location of the base, Service Providers/designers/contractors should give consideration to the safety of both the recovery operator and the road user. Recovery vehicles should not be located such that they are required to carry out dangerous manoeuvres on the network in order to exit or leave their base. If located adjacent to the carriageway they should be suitably protected from accidents involving errant vehicles or debris. The use of cones, permanent barriers, temporary proprietary vehicle restraint barriers, etc should be considered as appropriate. Where appropriate, base stations may be protected by locating them behind bridge abutments/piers provided visibility for access and egress is not compromised.

4.3.6.3 The likelihood of congestion/accident will influence the level of response time required and this should be considered at the pre-contract planning stage.

4.3.6.4 The Service Provider must carry out a risk assessment of his proposals before implementation. The Service Manager must satisfy himself that this risk assessment is adequate before giving agreement to any location.

4.3.6.5 When choosing the location of the base, the Service Provider should consider use of the following:

- (a) **Motorway Service Areas** – If these are convenient for the works, they offer an ideal and safe location. Local permissions from the operators should be obtained.
- (b) **Local garages located off network** – These are not appropriate where congestion is likely to block slip roads/local roads quickly preventing access. Response times will depend on distance away from site.
- (c) **Hard shoulder** – Sufficient width should be provided to ensure ease of access/egress. Temporary widening of the back of hard shoulder may be required if there is insufficient width. Adequate protection is essential. Consideration should be given to arrangements for recovery vehicles to turn around before they return to base.
- (d) **Slip roads** – As for hard shoulder.

- (e) **Access roads** – Where access roads are provided for emergency access and or gritting purposes, these can offer a useful location for the recovery base provided there is sufficient width to allow their intended use to continue unhindered.
- (f) **Lay-bys** – on / off the Network
- (g) **Verge hard standings** - Where there is sufficient highway land, a temporary hard standing behind the hard shoulder or verge may be constructed to accommodate the base station. After completion of the road works temporary hard standings should be removed to prevent their use as general stopping points. In locations where the provision of a hard standing would involve substantial construction costs, consideration should be given to more cost effective alternatives.
- (h) **Abnormal load lay-bys** – If conveniently located near to the works, these can offer a low cost option. Prior to use, the Police should be consulted regarding likely abnormal load movements during the works period. Protection should be provided as appropriate and signage to deter illegal parking erected.
- (i) **Emergency refuges** – These should be avoided if possible unless the works prevent their use by road users.
- (j) **Service Provider’s depots and compounds** – Local maintenance depots and winter maintenance compounds may be used subject to there being sufficient space and easy access to the network. The Service Manager should seek permission for use at a very early stage of planning, as there will be issues of safety and security to overcome.
- (k) **Surplus land** – Land located within junctions or owned by the Highways Agency can be used subject to the use not interfering with sight lines, visibility splays etc and safe access and egress being possible.

4.3.7 Setting down locations

- 4.3.7.1 Once the broken down vehicle and its occupants have been recovered, the recovery operator needs to be able to convey them to a safe location as quickly and safely as possible so that he/she can return to standby ready for the next incident.
- 4.3.7.2 The Service Provider should give consideration to the following when deciding upon a setting down location:
- (a) **Safety** – Recovered motorists should be protected as far as reasonably practicable from the possibility of involvement in accidents with other traffic. Hence, if possible, the setting down point should not be located on a high-speed road. Where this is not possible, physical barriers should be provided to give some protection from traffic.
 - (b) **Security** – It is important to consider and mitigate as far as practicable any danger to recovered occupants from criminal threat or activity. In remote setting down locations, it may be necessary to provide safeguards in the form of staff or CCTV and lighting.
 - (c) **Facilities** – It is strongly recommended that telephone facilities are available to enable recovered motorists to make arrangements for further assistance.
- 4.3.7.3 In addition to the above requirement the following facilities are deemed to be desirable but not essential:
- a) Toilet facilities
 - b) Drinking water facilities
 - c) Shelter with heat, light and seating.

- 4.3.7.4 **Suitable locations** - Listed below are typical locations that are currently used as setting down locations for recovered vehicles and occupants. However this list is not exhaustive, and circumstances may arise where a combination of these locations on a day / night basis may best serve the interests of the road users. In addition, local knowledge may be employed to identify unique locations, which fulfil the requirements for setting down recovered vehicles and occupants. The Police are often able to advise on this.
- a) **Motorway Service Areas** – At service areas, the facilities for recovered vehicles and passengers listed above already exist. Setting down recovered vehicles and passengers at a service area should be considered whenever one is near a road works site. The service area operator should be consulted at the planning stage to ensure that there are no insurmountable problems.
 - b) **Local services or garages** – Checks should be made to ensure facilities are 24 hour and the local Police should be consulted to ensure there are no security issues.
 - c) **Service Provider’s compound** – Service Provider’s compounds may be considered as setting down locations where they are situated close to the road works site and there is sufficient land for parking and other facilities. For safety and security, it will generally be necessary to fence off the recovery setting down area from plant, materials, and any potential health and safety hazards in the compound.
 - d) **Winter maintenance compounds** – As for Service Provider’s compounds. Operational times may not coincide with the site times causing problems of access/security.
 - e) **Temporary lay-by** – Where there is sufficient land available within the highway boundary, a temporary lay-by behind the hard shoulder may be constructed to accommodate recovered vehicles and passengers. However the construction of the temporary lay-bys may be made impractical by topographical and land ownership factors. After completion of the road works temporary lay-bys should be removed to prevent their use as general stopping points. In locations where the provision of a temporary lay-by would involve substantial construction costs, consideration should be given to more cost effective setting down locations.
 - f) **Off route lay-bys** – Where the road works are near a suitable junction, a lay-by on an adjoining road may provide a good location for setting down recovered vehicles and occupants.
 - g) **Hard shoulder** – This option is unlikely to be suitable since the facilities listed in 4.3.7.2 and 4.3.7.3 are not available.

If the hard shoulder is selected, some measure of physical protection from passing traffic must be given to the setting down point. The provision of a suitable impact protection vehicle equipped with a crash cushion or the deployment of a temporary vehicle restraint barrier are two possible ways of providing such protection. Neither method will be able to fully protect a broken down vehicle from damage should an HGV impact at speed. If either of these methods is being considered advice should be sought from the Service Manager on their deployment.

4.3.8 Leaflets

4.3.8.1 The Specification for Highway Works requires that leaflets are handed out to drivers/riders of recovered vehicles. The leaflets should include telephone numbers for directory enquiries, motoring organisations and local garages (only after liaison with the Police) which may assist with onward recovery. See Notes for Guidance on the Specification for Highway Works, Clause NG120.2(v).

4.3.9 Vehicles & Equipment

4.3.9.1 The Specification for Highway Works (see MCDHW Vol 1 Cl 120 and Vol 2 Appendix 1/20) provides a generic specification for basic types of recovery vehicles, equipment and inspection requirements.

4.3.9.2 The designer should note that the list of equipment represents only guidance and he/she is recommended to consult with one of the recognised recovery industry associations for advice and guidance on the latest equipment and capabilities of vehicles. Alternative equipment specifications should be agreed with the Service Manager.

4.3.9.3 The use of impact protection vehicles (IPV) should be considered where vehicle speeds passing the broken down vehicle are generally in excess of 30 mph. This applies to the incident site and also to the setting down point.

4.3.10 Communications

4.3.10.1 The key to an effective recovery system on site is good communication between the relevant parties.

4.3.10.2 The Service Provider must operate an effective two-way communication system, which takes account of any local communication black spots or low signal areas. Secondary 'back-up' communication systems must also be provided to ensure continued service.

4.3.10.3 A dedicated landline must be provided between the recovery base station / CCTV monitoring station, the Regional Control Centre and the Police for use in emergencies.

4.3.11 Qualification & Training

4.3.11.1 Vehicle recovery operatives must hold appropriate certificates of competence for the tasks they are performing.

The Sector Skills Council for the industry has developed National Vocational Qualifications in respect of automotive skills. Advice can be gained from the Service Manager. In addition, vehicle recovery operatives must hold a current driving licence free of endorsements other than for parking or speeding. They must also have in place, appropriate insurance covering damage to broken down vehicles while being recovered to a place of safety as well as third party liability insurance.

4.3.11.2 **With effect from September 2006, all recovery operators working within Highways Agency construction sites must be accredited to the National Highway Sector Scheme for Vehicle Recovery at Highway Construction Sites.** As soon as Sector Scheme SS17 is available, recovery vehicle operators on Highways Agency sites will be expected to be registered to the scheme within 12 months of its availability on the United Kingdom Accreditation Scheme (UKAS) web-site.

4.3.11.3 The company employing vehicle recovery operatives must ensure that each individual is vetted in respect of a Police record, which may be audited under the sector scheme.

4.4 Provision of Speed Cameras at Road works

4.4.1 Introduction

For the safety of both road users and road workers, a temporary mandatory speed limit of 50mph or less is frequently imposed at major road works sites. An effective tool in improving compliance with temporary reduced speed limits is the use of speed cameras.

This chapter provides background about new wider Road Safety Partnerships, which replace the thirty eight English Road Safety Partnerships, provides instruction on making allowance for increased costs and gives guidance on providing speeds cameras within road work sites.

4.4.2 Background

Historical Road Safety Partnerships have evolved into Wider Road Safety Partnerships, which are now fully established. These new partnerships give local authorities, the Police and other local partners greater freedom and flexibility to pursue whichever locally agreed mix of road safety measures they see fit in order to reduce road casualties in their area. With the new arrangements come greater local accountability for the future deployment and operation of cameras.

These new arrangements mean that the previous cost recovery process, for the processing of fixed penalty notices, is no longer available. Although fixed and mobile Highways Agency core camera site costs are covered by local authority local transport plan settlements those for road works may not be. Given the wide variation in make up and operation of these newly evolving partnerships, largely funded by local transport plans, it is not yet possible to present a national model for these costs. For this reason individual cost negotiations will need to take place as explained below.

4.4.3 Guidance

DfT Circular 01/2007 '**Use of Speed and Red-Light Cameras for Traffic Enforcement**' provides guidance and best practice advice on deployment, visibility and signing. This document is available for download from the [DfT web site](#). Service Providers should be aware of their responsibilities regarding deployment.

The Highways Agency has issued a document '**Speed Limit Enforcement at Road works: Guidance and Best Practice**' which offers advice and procedures to follow when carrying out this activity. The Service Provider is strongly advised to take this guidance into account when planning major schemes where the speed limit is to be enforced.

The Highways Agency's guidance and best practice document referred to above offers advice on roles and responsibilities of various parties involved, in particular highlighting the earliest possible communication with the enforcing authority (the Police, through the relevant Wider Road Safety partnership).

Advice is also provided regarding key activities including the use of TASCAR (Temporary Automatic Speed Cameras at Road Works) clauses in contracts, regulations, evidence recording and witness statements.

Where TASCAR systems for roadworks are to be used, the requirements are set out in the Manual of Contract Documents for Highways Works (MCDHW), Volume 2, Series NG 100.

4.4.4 Working with Partnerships

The most appropriate way of operating a speed camera system at road works is by cooperation with the Wider Road Safety Partnership. The Highways Agency remains committed to the working in partnership with these groups. These Partnerships offer the ideal forum for Police consultation, publicity preparation, camera deployment and signing regimes to be developed.

4.4.5 Cost Issues

Service Providers must ensure that all necessary speed enforcement equipment costs are planned into scheme costs given the cost recovery process previously available to fund speed limit enforcement terminated in April 2007.

As back office processing costs were previously 'cost recovered' by Safety Camera Partnerships, they did not impact upon HA budgets. From 01 April 2007, the Highways Agency may be asked to contribute to these operational costs by Wider Road Safety Partnerships. Area Performance Teams, with the assistance of their Service Manager, must negotiate payment of back office processing costs where road works schemes include a requirement for temporary speed limit enforcement using cameras. This is in addition to the equipment costs which would also be incurred.

Back office processing costs are difficult to forecast and could be substantial, so to avoid potentially significant overspends, early communication with Wider Road Safety Partnerships is strongly recommended. Some analysis of previous and planned enforcement schemes resulted in an indicative average cost of £65k per enforcement site per month.

Some large partnerships might choose not to impose these charges, but it is expected that most will.

Existing Highways Agency contacts with historical Safety Camera Partnerships should be used and involved in these discussions as soon as possible. Service Providers should contact their Service Manager to obtain the name of the contact(s) covering their Network.

Negotiation should include development of a suitable scheme specific enforcement regime which

- a) provides a deterrent to speeding motorists by ensuring enough 'real' camera enforcement takes place.
- b) minimises the impact of our scheme on the normal operation of the partnership. This will also serve to minimise costs to the Highways Agency.

4.4.6 Signing

Speed check area signs and speed cameras signs, as appropriate, must be used where there is a reduced maximum speed limit in force within the works site and the Police / Wider Road Safety Partnership have agreed to operate speed enforcement equipment.

Signs should be located in pairs (one on each side of the carriageway or slip road) within the verge, central reserve or works site

4.4.7 Further Information

Further information on these matters may be obtained from the NetServ Network Operational Policy Team.

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3.1 General

3.1.1 Introduction

The aim of the advice is to make available practices that have been found to achieve the required performance level. Advice is provided for each Technical Area on how the performance requirements can be achieved for that aspect of the Routine Service:

- Aspects of condition that are likely to indicate failure to meet the performance requirements
- Reference to Design Standards and Advice Notes that describe the performance requirements in more detail
- Advice on further activities to undertake that will aid the achievement of the performance requirements

The aim of the advice is to make policies that have been found to achieve the required performance and provide examples of best value.

3.1.2 Inspections

All inspections must be co-ordinated, as fully as possible, with the inspections of items in the highway as a whole (e.g. Deflectograph survey,) or in the case of covers, gratings, frames and boxes with the cleaning out of highway gullies, catchpits and interceptors. Wet weather inspections must be undertaken at locations causing concern even if a dry weather inspection has been undertaken (e.g. every 4th Inspection).

Inspections should be carried out with hand-held data collection devices (DCD), using standard data capture programs that include check-lists setting out the various defects to be noted. The data must be downloaded into the database management system when the inspection has been completed.

The Service Manager's RMMS Manual gives guidance on the items to be inspected and defects to be noted. Check-lists are programmed on to the DCDs for recording the inspections, enabling quick reference on site.

3.1.2.1 Detailed Inspections

Detailed inspections are generally to identify defects in all Technical Areas except structures and tunnels. For structures and tunnels, General and Principal inspections are used. Arrangements for detailed inspections must seek to minimise disruption to traffic whilst providing adequate access for proper inspections and maintaining a safe working environment for the inspectors.

Wherever possible, inspections that require lane closures should be carried out when closures are in operation for other maintenance work. Where separate lane closures are necessary, inspections should be undertaken in off-peak periods and consideration given to night-time working or mobile lane closures to keep delays to road users to a minimum and reduce the risk of accidents.

Detailed inspections for defects in and along the edges of dual 3-lane carriageways, or wider, must be carried out from the hard shoulder or grass verge/nearside lane. The condition of the carriageway surface, road studs and road markings in all lanes must also be observed from the edge of the carriageway together with gullies, kerbing and edges adjacent to the nearside verge and central reservation.

Using lane closures in place for other purposes, previous experience has shown that a Detailed Inspection can be carried out from the central reserve, with the offside lane coned off. This Inspection can cover all items within and adjacent to the central reserve. Additionally, the centre and offside lanes of the carriageway, as well as the road markings and road studs between the lanes, must be inspected. For 2-lane dual carriageways, inspections from the hard shoulder and grass verge/nearside lane should be adequate for recording defects across the full carriageway width. Offside lane restrictions for these roads should only be adopted to protect personnel inspecting items within the central reservation.

The Detailed Inspection record must include details of the manner of Inspection (e.g. offside lane closure or hard shoulder), the weather conditions and any other unusual features of the inspection. Nil returns must be recorded in the database.

3.1.2.2 General Inspections

A General Inspection comprises a visual inspection of all parts of the structure or tunnel that can be inspected without the need for special access equipment or traffic management arrangements. General Inspections are fully described in BD63 and BD53.

3.1.2.3 Principal Inspections

A Principal Inspection is more comprehensive and provides more detailed information than a General Inspection. A Principal Inspection comprises a close examination, within touching distance, of all inspectable parts of a structure and tunnel. Principal Inspections are fully described in BD63, BD53 and HD41.

It should be noted that periodic inspection and testing of electrical installations must also be in accordance with BS 7671 as required for particular items. Consideration should be given to the co-ordination of BS 7671 inspections and testing with Principal inspections.

3.1.2.4 Special Inspections

A Special Inspection for structure or tunnel may comprise a close visual inspection, testing and/or monitoring and may involve a one-off inspection, a series of inspections or an on-going programme of inspections. As such, Special Inspections are tailored to specific needs. Special Inspections are fully described in BD63 and BD53.

3.1.2.5 Safety Inspections

Safety inspections are regular visual inspections designed to identify the presence of Category 1 defects and are traditionally carried out by 2 trained personnel operating together from a slow moving vehicle. In particular circumstances (e.g. in town centres, principal shopping areas, subways, footbridges and at complex road junctions) inspection personnel may need to proceed on foot either to confirm suspected faults or to complete the Inspection. It may be appropriate to undertake Safety inspections at off-peak times or at night in order to minimise the traffic disruption and maximise the safety of both the inspectors and the public. It is important to remember that Safety Inspections also cover highway structures and tunnels and must identify obvious deficiencies which represent, or might lead to, a danger to the public and therefore require immediate or urgent attention; details are provided in BD63 and BD53.

Safety Inspection data must be loaded into the management database including those showing a nil return. Safety Inspection records include details of the weather conditions, road surface condition and any unusual features of the method of inspection.

Certain very vulnerable sites (e.g. Severn Bridge and all road tunnels) may be subject to continuous surveillance. This surveillance is, generally, largely dependent on video monitoring and is primarily designed to generate prompt response to traffic incidents. The monitoring should not be considered automatically as an alternative to Safety inspections.

Reports and complaints received from other sources must be similarly recorded on the database and retained together with details of specific inspections and actions taken.

3.1.2.6 Safety Patrols

The function of Safety Patrols is to supplement Safety inspections by providing a structured, more frequent surveillance of the road network to identify obvious hazards (Category 1 defects).

A Safety Patrol is normally carried out by an inspector in a vehicle travelling slowly at prevailing traffic speeds, without disrupting the traffic flow. At particular sites it may be appropriate for Safety Patrols to be undertaken on foot.

A record must be made of all Safety Patrols undertaken, including the date, the inspector, the method, and the time that each section of the road was patrolled.

Safety Patrols have traditionally been undertaken on Category A roads between the Safety inspections. The road category and local circumstances will determine the frequency of the patrols. At junctions it will generally be unnecessary to patrol the main carriageway and all the associated slip roads, but at more complex interchanges it may be necessary to cover only some of the link roads. A schedule of the link roads and slip roads to receive Safety Patrols must be agreed with the Service Manager.

3.1.3 Information Management

Valuable information may be gained from records of repairs. For example, a high incidence of repairs at a location can highlight the need to consider a more widespread treatment.

The Service Provider is required to ensure that all relevant data pertaining to the performance of the Highways Agency's assets is recorded in the Highways Agency's operational Asset Databases. This includes the updating of the record sets as a result of both maintenance activities and inspections/surveys.

3.1.4 Operations Plans and Manuals

Operations plans and manuals form the equipment manufacturers' recommendations and must be taken as a starting point for scheduling equipment maintenance. These schedules are normally described as time intervals based on maximum use but actual use may be less. Conversely, the environment may be more aggressive than is assumed by manufacturers at the time of installation and this may act to shorten the life of equipment. Before amending the operations plan, a qualified person must gather and analyse operational information based on past performance. Other means of identifying the need for servicing, such as remote monitoring, may also be adopted. The reasons for any variations to the maintenance schedules to achieve the performance requirements must be recorded and the effects of the changes monitored and reviewed.

3.2 Paved Areas**3.2.1 General**

Particular attention must be paid to potholes and other localised defects since these may often constitute an immediate or imminent hazard. Such localised defects must be dealt with by Service Providers so as to protect road users and minimise user delays.

Routine and structural maintenance activities that are similar in nature should be differentiated. It is usual, before carrying out resurfacing or other surface treatment, to ensure that the underlying road structure is sound. This often requires repairs to potholes, rutting, open joints, etc., that would otherwise be carried out as routine activities if no renewal work is planned.

The repair of defects reported from inspections may be absorbed into renewal works already due to be carried out in the planned maintenance programme. However, renewal works will usually be contained within the planned maintenance programme, determined on the basis of national priorities. When these schemes are deferred, routine maintenance repairs may be needed separately and at relatively short notice.

3.2.2 Carriageways

Conditions that are likely to prevent the achievement of the performance requirements include:

All Carriageways

- Difference in level between items (such as covers, gratings, frames and boxes) and the abutting carriageway, or differential levels between different components, exceeding 20mm.
- Parallel gullies and other gratings in carriageways, which have gaps more than 20mm wide parallel to the normal line of movement of pedal and motor cycles.
- Overgrown vegetation that is causing a hazard by encroaching on sight lines.

Flexible surfacing

- Localised cracking or breaking up (including edge deterioration) confined to a discrete area of the carriageway, or around a reinstated trench or patch and not associated with structural maintenance activities. This includes cracking or breaking up around ironwork, a difference in the level of a reinstated trench or patch with the surrounding carriageway and potholes.
- Depressions exceeding 20mm
- Fretting, or loss of material from the carriageway surface, or around a reinstated trench or patch
- Open or excessive surfacing joints wider than 20mm.

Concrete surfacing

- Spalling at joints and cracks, opening of longitudinal joints, failure of sealed cracks, vertical movement resulting in stepping at a joint or crack and also cracking.
- Dynamic movement under traffic at joints and cracks caused by lack of support from the sub-base or lack of, or ineffective, load transfer dowels or tie bars at joints. Dynamic movement is also associated with mud pumping, the usual signs of which are muddy stains on the surface of the slab.
- Vertical movement of slabs, observed in the form of settlement of the slab.
- Cracking or scaling of surface, and a loss of texture.

- Failed repairs, such as failure of overbanding or sealed cracks.

HD31 and HD32 give recommendations for the maintenance and repair of flexible and concrete pavements respectively. Repair procedures for carriageways are described in SHW Series 700, 800, 900, 1000 and 1100.

Some minor carriageway repairs may be due to the activities of the Statutory Undertakers or licence holders who are governed by the New Roads and Street Works Act 1991. From 1st January 1993 if the excavation is still within its guarantee period and fails to meet the performance criteria, as defined in Paragraph S1.2 and Chapter S2 of the Specification for the Reinstatement of Openings in Highways, the Undertaker must be informed of the defect, using the procedure contained in Chapter 4 of the Code of Practice for inspections and the defect inspection procedure invoked. If a potentially hazardous reinstatement is discovered, the reinstatement must be protected by signing, lighting and guarding while awaiting the Undertaker. In exceptional circumstances, (where there are safety implications for the road users), the reinstatement may be made safe by the Service Provider. Any costs incurred in making safe a reinstatement must be recovered from the Undertaker. During the reinstatement guarantee period the Undertaker remains responsible for the maintenance and performance. However, defects at this stage may be picked up as a result of one of the inspection procedures.

3.2.3 Footways and cycle tracks

To meet the requirement for sustainable travel and accessibility, one objective is to provide safer and more acceptable facilities for pedestrians, cyclists and other vulnerable road users (such as horse riders). In the case of horse riders, particular emphasis is placed on the crossing of trunk roads using overbridges, and improving links to other destinations. Satisfactory surfaces on footways and cycle tracks may encourage walking and cycling respectively.

Footways include the walking surfaces of subways, underbridges, overbridges and pedestrian rights of way which are the responsibility of the Service Manager and may occasionally fall outside the Highway Boundary. HD39 and HD40 give advice on the construction and maintenance of footways.

A cycle track is a paved facility available for persons with pedal cycles, with or without a right of way on foot, usually within the Highway Boundary.

Defects on footways and cycle tracks affect safety, maintenance and serviceability. Compensation claims may result from defects that have not been repaired. Therefore, a pro-active rather than a re-active approach is needed, to identify defects before they become hazardous.

Conditions that are likely to prevent the achievement of the performance requirements include:

Footways and cycle tracks

- Unevenness, including ridges, projections, sharp edges (trips), cracks and gaps (>20mm). Block profiles, which include ridges, projections, sharp edges (trips) with a difference in level (>20mm), cracks and gaps (>20mm wide). Also slab rocking that creates a hazardous upstand (>20mm).
- Potholes, loss of material or small areas of depression (>25mm) which are creating or are likely to create a hazard.
- Local cracking of the asphalt surface confined to a discrete area or extensive cracking affecting the major part of a footway/cycle track. Fretting (loss of material leaving the coarse aggregate proud of the matrix or causing loss of coarse aggregate). Failed patch with adjacent cracking, loss of material from an existing area of patching, and difference in level (> 20mm) and depressions (> 25mm) that are creating a hazard.

- Trench reinstatement and adjacent cracking, loss of material (fretting) from a reinstated trench, and difference in level, (which applies when a trench has subsided or has been left proud following reinstatement and includes ridges, projections, sharp edges (trips), cracks and gaps (>20mm) and also depressions (>25mm)). A temporary reinstatement with a 10mm upstand or depression associated with a temporary reinstatement that poses a risk to users.
- Hazards such as fallen trees, unsafe signing, lighting or guarding of excavations, unsafe steps, persistent snow, ice or leaves, contaminants (such as oil) giving rise to slipping, a loose surface or encroachment by vegetation.

Footways

- Standing water (>10mm deep), which restricts the footway width to less than 500mm or is likely to cause pedestrians to use the adjacent carriageway. This is particularly a problem when the water freezes.
- Difference in levels between items (covers, gratings, frames and boxes) and abutting footway, or differential levels between different components (> 20mm).

Cycle tracks

- Standing water (>10mm deep), which restricts the cycle track width or is likely to cause cyclists to use the adjacent carriageway. This is particularly a problem when the water freezes.
- Parallel gullies and other gratings in cycle tracks with wide gaps (>20mm), parallel to the normal line of movement of pedal cycles.
- Difference in levels between items (such as covers, gratings, frames and boxes) and the abutting cycle track surface, or differential levels between different components (> 20mm).

Particular consideration must be given to defects, such as trips, which may constitute an immediate danger to pedestrians and/or cyclists. It should be noted that some hazards are likely to be seasonal. SHW Series 1100, HD39 and HD40 describe repair procedures for footways and cycle tracks.

Some defects may result from the activities of the Statutory Undertakers or licence holders who are governed by the New Roads and Street Works Act 1991. If defects occur, within the guarantee period, as defined in the Specification for the Reinstatement of Openings in Highways, the Undertaker must be informed of the defects, using the procedure contained in the Code of Practice for Inspections.

Occasionally, footways and cycle tracks adjacent to rural and urban trunk roads, may become disused. This may be due to unnecessary provision in the first place or changes in circumstances over the passage of time, or it may be due to an actual or perceived hazard. The reason for disuse needs to be established and if it is decided that it is due to unnecessary provision or change of use, then it may be appropriate to reduce the frequency of assessments. Judgement will be needed to decide if the facility is indeed disused and the situation will need to be monitored since it may return to use. For example a little used facility in an urban area may be considered for re-classification as "rural" for maintenance purposes. Where a disused facility represents a significant maintenance liability, consideration should be given to removing it.

Damage to the footways may be caused by vehicle over-riding, particularly in urban areas and at road junctions where the footway may be immediately adjacent to the carriageway edge. Consideration should then be given to the provision of high strength in-situ concrete margins up to 1m wide behind the kerb or locally at road junction radii. Alternatively, consideration should be given to carrying out an improvement scheme to alleviate the problem in which case a report and proposal for action should be made to the Service Manager. HD40 provides further advice.

Pre-cast concrete footway slabs that have superficial cracks only must not be replaced as a routine maintenance operation unless there is a need to reset the slab because of other defects.

3.2.4 Covers, gratings, frames and boxes

Conditions that are likely to prevent the achievement of the performance requirements include:

- Covers or gratings that constitute an immediate hazard, particularly by a relative movement under load exceeding 10mm. In urban areas, rocking covers or gratings causing noise should be identified as a defect with a high priority for treatment.
- Cracked or broken items which may be in danger of collapse and thus liable to cause a hazard.
- Worn covers are a hazard for pedal and motor-cycles from skidding in wet conditions.
- Missing items are likely to constitute a hazard.

Covers situated in verges that are traversed by pedestrians must not be ignored, as they may pose a hazard. It may often be difficult to decide whether a cracked or broken item is in real danger of collapse. If in doubt, it must be replaced, irrespective of its position.

SHW Series 500 describes the repair procedures for covers, gratings, frames and boxes. Defects in covers and gratings may pose particular danger to pedal and motor-cycle users. It should be remembered that occupancy of the road by these road users will not always be limited to the nearside lane and that the potential hazards affecting them may also occur in other lanes.

Rocking gratings or covers with only small movement under load may nevertheless be a nuisance in urban areas because of the intrusive noise they make. If complaints are received, they should be corrected.

When inspecting the gratings of gullies and other similar surface water catchment items, the opportunity should be taken to check that the item is functioning satisfactorily and is not partially or wholly blocked.

3.2.5 Kerbs, edgings and pre-formed channels

Conditions that are likely to prevent the achievement of the performance requirements include:

- Vertical projections (> 20mm) and horizontal projections (> 50mm)
- Loose / rocking / damaged kerbs and/or damaged, edgings and pre-formed channels of all types which are creating or are likely to create a hazard or lead to loss of support or protection.
- Poor local alignment of pre-formed channels which could give rise to danger or nuisance from standing water or damage to the highway structure caused by water penetration.
- Missing kerbs, edgings and pre-formed channels of all types

Although kerbs, edgings and pre-formed channels, tend to be stable by their nature and construction specification, hazardous conditions can develop quickly when either individual kerbs, or short lengths, are damaged or moved out of alignment by heavy vehicles, or by local subsidence. Frequent damage by heavy vehicles may suggest the need for local re-alignment or a more robust treatment. Short lengths of kerb serving gullies or grips must not be overlooked. SHW Series 1100 describes repair procedures for kerbs, edgings and pre-formed channels.

3.3 Drainage**3.3.1 General**

Adequate drainage facilities must be present and operate correctly to:

- Avoid the accumulation of water on the trafficked surfaces of the highway that reduces the safety of the road user.
- Adequately drain the road pavement structure to reduce maintenance liabilities and help realise the design life of the road.
- Avoid disruption to the traffic flow caused by flooding.
- Prevent nuisance to adjoining landowners caused by flooding.
- Avoid polluted effluent, from the highway drainage facilities, being directed indiscriminately into watercourses.
- Avoid reuse/recycle of runoff effluent during drains cleansing operations

Conditions that are likely to prevent the achievement of the performance requirements are:

- Full or partial blockage
- Standing water
- Detritus /refuse / weed growth / roots are all likely to reduce flow, damage the structure and may appear unsightly.
- Cracking / deformation / alignment of components of the drainage system adversely affecting the structural or hydraulic performance or durability of components of the system.
- Complete structural failure of components of the drainage system.
- Removal of material in the invert (scour) adversely affecting the hydraulic or structural performance or durability of components of the system.
- Removal of material in sides/ banks / walls / bunds by erosion
- Complete or partial blocking of filter material.
- Displacement of surface filter material
- Inadequate flow of water prevents self-cleaning.
- Surcharge of water not contained within the drainage system.
- Inadequate facilities for the removal of water from the balancing pond
- Failure or incorrect operation of equipment associated with outfall regulating device pump / sluice / tidal flap / headwall / apron / penstock
- Damage to grassed surface water channels (e.g. by vehicle overrun).
- Loose, rocking, ridges, projections, sharp edges (trips), cracks and gaps that result in an element of the linear drainage system projecting >20mm.
- Flooding of the highway, adjoining property or services caused by the inadequate provision or operation of highway drainage, or other facilities.

The Service Provider is reminded that consideration must be given to the likely presence of protected species in all drainage features and that appropriate advice must be sought from an ecologist or the regional environmental advisor, before commencing work.

3.3.2 Piped drainage systems

Records of the condition and location of the drainage network, in a standard format will greatly assist the interpretation of the likely performance and the repair of the highway drainage network. In particular, CCTV surveys of the existing drainage network have been adopted for a comprehensive record of the type and condition of drainage facilities. Ownership of the piped drainage systems must be established and indicated on the record.

If properly designed and constructed, piped drainage systems should normally be self-cleansing and maintenance is only necessary when a blockage or another fault occurs. Those parts of a system that often give trouble (e.g. are prone to flooding) will be known or faults can be identified from safety inspections, or reports and complaints received from other sources.

Symptoms of blockage or faults that prompt further investigation include: backing up and flooding at the entry points to the piped drainage system; dry outfalls; wet areas on verges; and the presence of lush vegetation.

Suitable methods of inspection include:

- Inspection of the facilities during gully, manhole, catchpit and interceptor emptying and cleansing operations
- Although the conventional method of pulling a mandrel through the pipeline may indicate if a pipe is broken, distorted, silted up or contains roots, but cannot be relied on to distinguish between these defects;
- Video inspections that need not be restricted to parts of the network having particular drainage problems. CCTV is currently the most informative inspection method and can be used as an inventory asset condition tool. The technique can indicate a wide range of defects (e.g. cracks, blemishes, encrustation, displaced or open joints, silt build up, debris, depressed or collapsed pipe sections, and root ingress) and may be carried out in conjunction with flushing. Advice on the format for CCTV surveys and reporting is contained in the SHW Specification MCHW Volume 1, Series 500. A library of reports and video recordings containing records for a period of 12 years may be needed to provide a comprehensive record of all the drainage facilities.
- Hand-rodging is a suitable technique for gully connections or short pipe connections where a mandrel or video inspection cannot be used. This method is not very informative but should indicate blockages and silt build up.
- Flushing of pipelines is less informative than using a mandrel but provides the best method of inspection in areas of subsidence and where the use of a mandrel is not appropriate. Flushing should be by means of high volume, low-pressure water.
- Inspections at manholes, catchpits and interceptors during or immediately following a period of prolonged rainfall can provide: measurements of the depth of water within the entries of pipes, in successive manholes, catchpits or interceptors along a drain run may indicate any blockage or fault.

Flushing under pressure is not appropriate for filter drain and fin/narrow filter drainpipes. Also, structured wall thermoplastic pipes may not withstand high jetting pressures and the structural condition of much of the highway drainage network is unknown. Where the condition of any sewer or highway drain is not known, it is recommended that the maximum pressure does not exceed 130MPa (1900psi).

Other sources of guidance on the maintenance of piped drainage systems are:
Sewer Jetting Code of Practice (WRC, 1997).
Series 500 of SHW (Drainage and Service Ducts) MCHW Volume 1.

3.3.3 Gullies, catchpits, grit traps, interceptors, soakaways and manholes

Experience has shown that the operation and maintenance of these items is effective if they are emptied of silt and other detritus at a frequency that is sufficient that solids do not enter the drainage system. The operation of soakaways, in particular the soakage rate, may be checked against their design for satisfactory working. The soakage rate can be measured after a period of prolonged rainfall using the falling head method described in BS5930.

Pollution may arise from gully cleaning and the decomposition of organic material in the gully sump. Material with a high biological oxygen demand (BOD), washed into a watercourse from the highway drain during periods of low base flow, can result in pollution with the consequent impact on aquatic life forms. The re-use of water from the gully sump for flushing purposes may result in the pollution of downstream watercourse systems. Particular care will need to be taken in respect of health and safety for the cleaning of large diameter deep bored soakaways.

Other sources of guidance on the maintenance of gullies, catchpits, grit traps, interceptors, soakaways and manholes are:

Series 500 of SHW (Drainage and Service Ducts) MCDHW Volume 1.

3.3.4 Piped grips

The importance of piped grips should not be under-estimated. They have often been added some time after construction or re-alignment of the road, at known sensitive drainage points or as an alternative to a grip to provide safer passage along soft verges for pedestrians and equestrians. The connecting pipe is usually laid close to the surface and is therefore prone to damage. This in turn may result in a blockage. A waterlogged verge is often an indication of ineffective grips.

Methods of checking the operation of piped grips include proving, by hand rodding and/or high volume low pressure flushing, or jetting with water.

3.3.5 Grips

Grips need to be re-cut to maintain their function fully, at a frequency established by experience. A frequency of once each year is normally necessary and is best carried out following verge cutting. Re-cutting the grips may cause excessively deep channels across the verge and these may be a safety hazard to other users of the verge (e.g. pedestrians and equestrians). In this case conversion of the grip to a piped grip or another suitable drainage system should be considered.

3.3.6 Ditches

Ditches can become overgrown with vegetation, silted, blocked with debris/rubbish, or the banks may be eroded, to the extent that flow is impeded. Water in the ditch is not itself harmful unless stagnation (resulting in a health hazard) or flooding occurs, or a resulting high water table adversely affects the road or other structural foundations. Water in a ditch may be a nuisance to adjacent land users.

Cleaning out of ditches normally requires a machine excavator. Before ditch clearance is undertaken advice must be sought from specialist ecological advisers and the locations of SSSIs confirmed.

3.3.7 Filter Drains and Fin/Narrow Filter Drains

The efficiency of filter drains can be seriously impaired by the formation of a silt crust, with or without vegetation growth, on the top of the filter material, or by the accumulation of trapped silt in

the lower layers. The efficiency of fin/narrow filter drains can be seriously impaired by the accumulation of trapped silt in the lower layers.

The surface condition of filter drains can be detected easily by inspection at ground level, but the deeper accumulations can only be confirmed by excavation, usually by means of trial pits. Where the filter drain performs the dual role of surface and sub-surface water collection, ponding at the surface will occur if the drains are not performing adequately. If there is no obvious surface defect, ponding will almost certainly indicate silt in the lower layer. Defects in fin/narrow filter drains are not easily detected and usually can only be confirmed by the excavation of trial pits. Pavement vibration during the passage of a heavy vehicle may indicate a water logged foundation caused by a defective fin/narrow filter drain.

It is probable that, unless there is an obvious cause for a localised defect, a length of filter drain or fin/narrow filter drain will show a consistent defect. The replacement of the filter media, by either new or cleaned existing material, will usually be carried out as part of the planned programme of maintenance works. Where alternative surface finishes have been used for filter drains, e.g. pre-coated chips, tar spray or bitumen bonded shredded tyres, an appropriate cleaning method will need to be chosen.

Where work is carried out on filter drains care should be taken to preserve the integrity of geotextile liners if present.

Failure of fin and narrow filter drains can have a detrimental effect on the longevity of the pavement. Where the performance is not adequate, the installation of a catchpit (e.g. Type 7) at, say, every 200m along the line of the filter or fin drain has been found to be an effective action.

Further advice is available in Series 500 of SHW (Drainage and Service Ducts) MCHW Volume 1.

3.3.8 Culverts

Many culverts can tolerate some silting and vegetation growth before efficiency is impaired to the point where the culvert needs clearing. Grills fitted across the ends of some culverts are however particularly prone to blockage, restricting the free flow of water through the culvert. Video inspections have been found to be suitable for determining the structural condition of culverts.

Further advice is available in Series 500 of SHW (Drainage and Service Ducts) MCHW Volume 1.

3.3.9 Vegetative drainage systems for highway runoff

Vegetative drainage systems are examples of systems described elsewhere as sustainable drainage systems that are suitable for highway use for the conveying, storing and treating highway runoff. They are designed to enable the Highways Agency to comply with pollution protection legislation so as not to pollute receiving water courses. As a consequence of this, maintenance of these systems is essential for the continuing protection and must take priority.

DMRB standard HA 103 includes requirements and advice for the maintenance of such systems. Although specific maintenance regimes are suggested the Service Provider is encouraged to adopt a proactive approach based on local knowledge and site specific issues to fulfil the performance requirements detailed in the Code.

The effectiveness of vegetative treatment systems can be easily and seriously impaired. There are some common faults that have been found to significantly affect their performance:

- Blockage of the feeder pipes or ditches
- Silting in ponds causing a loss of storage capacity and an accumulation of heavy metals that may increase the risk of pollution

- Damage or erosion to pond banks, walls or bunds
- Damage or obstruction to pond outlet, which affects the controlled rate of discharge
- Loss or damage to vegetative treatment systems which renders pollutant removal ineffective

Pond operating systems may be quite complex and further planning is needed before maintenance starts:

- Operation and maintenance manuals may describe procedures for the effective management of the pond
- Balancing ponds may often become important sites for nature conservation. Prior to commencing maintenance it is advised that relevant ecological issues are addressed.
- Planned replacement of pond vegetative treatment systems (e.g. on a cyclic basis) can be planned as part of the maintenance activities.

3.3.10 Ancillary Items

Retention tanks and pump wet wells are prone to silt accumulation which will affect the storage and operational efficiency of the installation. Failure of pumps and other specialist equipment can lead to flooding, pollution and excessive water on the highway. The manufacturer's advice on maintenance schedules for this equipment must be followed.

Effective operation of the ancillary equipment is maintained if the items are emptied of silt, grit and other detritus at intervals sufficient to avoid solids entering the equipment.

Further advice is available in Series 500 of SHW (Drainage and Service Ducts) MCD Volume 1.

3.3.11 Linear Drainage Systems

Linear drainage systems are shallow in depth and are generally at the edge of pavements, in nosings to slip roads and in central reserves. These systems are prone to accumulation of silt where the flow speed is insufficient to self-clean the system. Therefore, these items may need to be emptied of silt and other detritus to avoid solids entering the drainage system. Cleaning is normally carried out by large volume, low pressure, water flushing.

Silt and other solids arising, from emptying and cleaning operations may cause pollution. Material must be disposed of in accordance with the relevant waste management regulations and legislation.

3.3.12 Road-edge Surface water Channels

Road-edge surface water channels are now a widely used technique for dealing with surface water run-off from the road surface. Designers consider they often have advantages, including ease of maintenance, over filter drains and kerbs / gullies. Further information covering the design of drainage systems and of such channels is available in DMRB standards HD33 and HA 37.

Although road-edge surface water channels are designed to be low maintenance aspects that have been found to affect their performance include:

- Build-up of sediment or pollutant (particularly in areas where the channels are not self-cleansing)
- Blocked outfalls creating areas of ponded water

3.3.13 Grassed Surface Water Channels

Channels may become blocked from arisings from grass cutting of the verge. The cuttings may need to be removed around outlets and for the first 5 metres of channel upstream of the outlet. Elsewhere it is not usually necessary to remove the arisings.

Silt removal from the channel can be carried out by either water flushing or by manual or machine sweeping.

Silt and other solids arising from cleaning operations may cause pollution. Material must be disposed of in accordance with the relevant waste management regulations and legislation.

Vehicle rutting may change the direction of flow of water run-off. Where extensive rutting has occurred, it may be necessary to reshape and re-seed the verge with an approved grass seed type but other options (e.g. conversion to a hardened verge) may also be considered.

3.3.14 Flooding

Suitable diversion routes for traffic in flood-prone areas must be established in advance and agreed with Local Authorities so that a consistent system of diversions can be implemented rapidly when flooding occurs. These routes will need to include for the segregation of cars from vehicles with greater ground clearance that may be able to negotiate localised areas of flooding.

Monitoring of national and local weather forecasts and flood warnings from the Environment Agency can aid the initiation of preventative maintenance of drainage systems if it is considered that adverse conditions may lead to flooding or disruption of traffic.

Gullies may be blocked (e.g. by leaves) but gullies and other drainage items are often submerged and it may be difficult to confirm they are the cause of flooding. Covers may be dislodged particularly on hills where surcharging occurs. Reliable information on location and type of gullies through the availability of an up to date inventory would ease considerably the actions to undertake at the time of flooding.

Responsibilities for the maintenance and inspection of structures, drainage ditches and watercourses that interface with highway drainage systems must be established through consultation with all relevant organisations (e.g. Local Authorities, Environment Agency, and riparian owners). Provision of these details to appropriate maintenance staff will aid the effective organisation of the works in advance and at the time of flooding.

Alterations or improvements to the highway drainage system may prevent carriageway flooding caused by water being shed from adjacent land. It is not appropriate in all cases just to take the matter up with the adjacent landowner and positive advance actions may be a more efficient approach to the provision of adequate drainage.

3.4 Geotechnical Asset Management

3.4.1 General

HD 41 sets out the requirements for the management of geotechnical assets, including mandatory annual and Principal inspections. However geotechnical defect features may also be identified as a result of routine activities, such as the identification of Category 1 defects, recording of condition of other assets, or following other reports or complaints.

3.4.2 Geotechnical Asset Management

Providing a systematic and ordered approach to geotechnical asset management allows realisation of the following objectives:

- Integration of maintenance management with higher level business objectives;
- Integration of geotechnical asset management with other related parts of the asset (particularly structures, drainage and pavements) and to management of the asset as a whole;
- Maintenance of the asset in a safe, serviceable and sustainable condition;
- Demonstration of 'best-value' and minimisation of whole life costs and,
- Development of longer-term indicators of condition performance.

Geotechnical asset management comprises a suite of inter-related processes which are required to operate on a rolling cycle. Each process contributes to the primary objective of providing a safe, sustainable and serviceable network. The individual processes are principally as follows:

- Provision of the Geotechnical Asset Management Plan;
- Development of the asset inventory via detailed inspection, recording and reporting;
- Strategic risk assessment of geotechnical features;
- Data management;
- Programming and prioritisation of maintenance activities;
- Financial planning and,
- Review of outcomes against original asset management plan to recommence cycle.

Historically the individual processes have tended to be viewed discretely and the understanding of their integration into the wider process not fully developed. It needs to be appreciated that asset management, as a wider over-arching process and within the geotechnical sectors has not yet reached maturity.

The following takes a more detailed view of geotechnical asset management planning and details the standards and guidance that relate to the processes of asset inventory provision, data management and strategic risk assessment of geotechnical features.

3.4.3 Provision of the Geotechnical Asset Management Plan

It is widely recognised that a key facet of any successfully managed project is project planning; geotechnical asset management is no exception. Planning is an important element that will add structure to the wide-ranging scope of activities required of the Service Provider and is embodied in the provision of the Geotechnical Asset Management Plan (GAMP).

The GAMP can be viewed as a project-management tool and a strategic planning document to assist in the management of the geotechnical asset. Whilst greater adherence to project and business management techniques is growing ever important, it is crucial that the Service Provider maintains appropriate levels of geotechnical knowledge and resource levels. There may be some need to diversify skills, but the most important requirement will be for geotechnical staff to liaise with other disciplines to realise the whole process.

Requirements for the submission of the GAMP at prescribed intervals are set out in HD 41. A further one-off mandatory requirement is included at 3.4.3.1 below.

The Geotechnical Asset Management Plan should include:

- Outline of the contract requirements;
- Standards and specifications relevant to the contract;
- List of key geotechnical personnel;
- Asset inventory and condition assessment;
- Underlying geology of the asset and particular geotechnical hazards;
- Maintenance strategies for the long-term based on sustainable use of physical resources and whole life costing;
- Programme development to include inspections, surveys and any wider programmes of maintenance and improvement relating to the geotechnical asset;
- Network management information requirements and status;
- Operational consequences of outstanding maintenance obligations;
- Identification of future funding requirements to maintain required levels of service and,
- Performance reporting.

Differences in geology, geomorphological influences and hydrogeology at both a regional and national scale mean that the materials comprising the asset will vary significantly as will their physical properties. Consequently the mechanisms controlling and influencing the failure or degradation of the asset will vary in the same manner; that is being regionally specific. Maintenance strategies will need to reflect these regional variations and must be set out in the GAMP.

It is anticipated that the development of the GAMP will also contribute toward longer-term knowledge-management of the geotechnical asset and assist in minimising the knowledge loss that inevitably arises through the continuous cycle of change of service providers.

3.4.3.1 GAMP Submission

The GAMP will be used to contribute to Spending Review 2009 and this will be the first occasion when analysis tools will be used in this element of the Non-pavement Road Renewals programme. In support of this completion of GAMPs to a consistent standard is required.

Service Providers must ensure that before September 2008 they have updated and agreed their GAMP with the Service Manager and Geotechnical Advisor. These plans must include a future (5 year) programme and forecasts for all associated activities, including future remedial and preventative works and associated surveys, as well as targets for Geotechnical Asset Data population and quality assessment.

3.4.3.2 GAMP Support

To support the updating and completion of GAMP the Highways Agency Network Services - Technical Services Division (Geotechnics) will undertake a series of workshops with Service Providers to review quality, disseminate best practice, provide training (appropriate to the experience of the team) and review feedback. This exercise is planned to be undertaken in Summer 2008.

3.4.4 Standards and Guidance

HD41, 'Maintenance of Highway Geotechnical Assets' provides mandatory requirements and guidance for the Service Provider. It sets out the requirements for completing principal inspections, provision and capture of the asset inventory and condition information, reporting and risk assessment of geotechnical features, outline performance requirements for the asset and requirements to maintain the data management system. The DMRB can be downloaded from the Agency's website www.standardsforhighways.co.uk/dmrb/index.htm.

Further guidance on conducting principal inspections is also available as a 'download' from the Highways Agency Geotechnical Data Management System website at <http://www.hagdms.co.uk>. It is recommended that the electronic information on the website is viewed as a matter of course since both software and hardware developments that support inspection/analysis and reporting requirements are often issued as advice in advance of DMRB revisions.

The reporting requirements set out in HD 41 for the submission of the Geotechnical Principal Inspection Report and any reporting as part of 'survey requirements' to assess geotechnical defects are subject to the quality and risk management system, 'Geotechnical Certification' and are set out in HD22. Geotechnical Certification is undertaken by the Highways Agency's Geotechnical Advisor.

General guidance on Asset Management Planning is given in 'Well Maintained Highways: Code of Practice for Highway Maintenance Management' produced by the Roads Liaison Group. Further guidance is given in 'Framework for Highway Asset Management' produced by the County Surveyors Society. These documents can be downloaded from the Roads Liaison Group website at www.ukroadsliasongroup.org and also from the site www.roadscodes.org.

3.5 Structures**3.5.1 General**

Many of the activities for structures are minor in themselves, but failure to carry them out may lead to the deterioration of the structure, and the need for more serious and costly repair operations in the future. Generally, it is considered cost effective in whole life cost terms, to undertake timely cyclical and repair activities. These form an important component in the development of a coherent ongoing structures management strategy. In general the structure must be maintained to a condition that gives assurance of safety and serviceability for the next 12 months unless local conditions or experience has shown more regular monitoring is required.

The cyclical activities for structures are regarded as those which relate to servicing rather than repair and which will usually be undertaken regularly at pre-determined intervals in accordance with any operating manual, log book or routine maintenance schedule. Routine activities does not cover the repair or renewal of structural elements or components which have become unserviceable because of general wear and tear or have deteriorated for other reasons. Such work must be identified during the regular inspection process described in BD63, and included in a planned structural maintenance programme. Service Providers can get further guidance on classification of defects from the *'Inspection Manual for Highway Structures'*.

The inspection and maintenance requirements for the structure must be followed, along with any recommendations from the manufacturers of components used on the structure. However, manufacturer's recommendations are often at set time intervals, rather than as a function of the duty to which the items are subjected. These may vary with time and from location to location. Therefore, with competent judgement, manufacturers' recommendations may be varied in the light of local conditions and experience.

If there is a need to carry out frequent routine operations (e.g. drains regularly block), consideration should be given to the implementation of planned renewal maintenance works, to reduce the necessity for such frequency. The Service Provider should also consider the likelihood that debris near overbridges may be used as missiles to drop on traffic or the carriageway below and that more frequent cleansing or removal may be required. In particular locations the Service Provider may need to consider the use of CCTV for monitoring or increased patrolling to reduce the risk or make appropriate arrangements with the relevant authority to do the same.

The Service Provider is reminded that they are expected to be diligently implementing all of the requirements for the management of sub-standard structures, concrete half joint and hinge deck structures and that auditable records and monitoring information is to be input into SMIS and kept up to date, to enable the structures to be clearly documented. These issues, and associated instruction, are detailed at 3.5.4.

The Service Provider is reminded that consideration needs to be given to the likely presence of protected species, in particular bats, at structures. Appropriate advice must be sought from an ecologist or the Regional Environmental Advisor, before commencing work which may be subject to DEFRA licensing if their presence is confirmed. If bats are discovered during maintenance work, work must cease immediately and advice sought.

3.5.2 Maintenance Responsibilities

3.5.2.1 Overbridges

The Service Provider is responsible for the maintenance of all structural elements below and including the waterproofing membrane, together with the parapet and any protective safety fence. If the road carried is also a trunk road then the Service Provider is also responsible for the inspections and the maintenance of the highway elements in accordance with the procedures set out in other sections of this document. If the road carried is not a trunk road then the maintaining authority for that road will be responsible for the highways elements.

3.5.2.2 Underbridges

If a road through an underbridge is a trunk road the Service Provider is also responsible for the inspection and maintenance of that road. If a road through an underbridge is not a trunk road then the maintaining authority for that road will be responsible for its highway elements.

3.5.2.3 Subways

The Service Provider is responsible for the maintenance of structural elements of the subways. The maintaining authority for the footway through the subway is normally responsible for all routine activities which relate to the finishings, footway surfacing and drainage and lighting. Failure to carry out regular maintenance of these items does not normally prejudice the structural integrity of the subway. However particular attention is drawn to the maintenance of drainage pumps in subways (and also underpasses). The responsibility for such maintenance must always be clarified.

3.5.2.4 Footbridges and cycle bridges

The Service Provider is usually responsible for all maintenance activities on all items on the footbridge, including those which on an overbridge are deemed to be highway elements. However there may exceptionally be a special agreement with a local highway authority or other party, for maintenance of the footbridge surfacing and/or lighting on the bridge. The maintenance responsibility must be clarified.

3.5.2.5 Retaining walls

The ownership and maintenance responsibility for all retaining walls must be clarified. Where this is not the responsibility of the Service Provider, the Service Provider must ensure that the appropriate person or organisation is aware of their responsibilities.

3.5.3 Cyclic Maintenance

Examples of typical cyclical maintenance actions that need to be addressed. However, this list does not cover all possible maintenance actions that may exist and will require attention.

- Remove graffiti
- Remove undesirable vegetation, e.g. that blocks drainage, may cause structural damage or restricts access

- Remove debris, bird droppings and other detritus that blocks drainage and promotes corrosion or other deterioration
- Clear and ensure correct operation of drain holes, drainage channels and drainage systems
- Repair defective gap sealant to movement joints
- Check operation of flap valves and grease where required
- Replace expansion joint gaskets where this is a specific requirement identified in the Structure Maintenance Manual or Structure File
- Remove general dirt and debris from bearings. Where appropriate, clean sliding and roller surfaces if accessible and re-grease. Follow any additional advice contained in the bearing manufacturer's recommendations in the Structure Maintenance Manual or Structure File
- Ensure free flow of water through culverts
- Ensure correct operation of ancillary equipment (e.g. drainage pumps and associated sumps and pipework) and maintain certification of lifting devices
- Check (and rectify where necessary) seating of drainage gratings or covers, replace missing or defective items
- Check, clean and replace where necessary pedestrian security and safety measures (e.g. mirrors, handrails, non-slip surfaces)
- Check for scour damage around training works
- Check holding down assemblies
- Repair superficial defects in surface protection systems
- Ensure special finishes are clean and perform to the appropriate standards
- Remove loose kerbs/setts, discarded nuts, bolts & washers, and other debris that could be used as missiles drop on traffic or the carriageway below from overbridges

Routine service schedules must be held in the structure file for the structure. SMIS has the provision for holding electronically any operating manuals or log books (in the structure file branch) or routine service schedules, (called routine maintenance schedules in the maintenance branch).

3.5.3.1 Graffiti

The Highways Agency's policy is to remove obscene, blasphemous or offensive graffiti as soon as practicable after it has been observed. This graffiti is a Category 1 defect. However, discretion is required in the handling and timing of the removal of other graffiti. Where graffiti is persistent and widespread in environmentally sensitive areas, consideration can be given to alternative options, other than the frequent removal or obliteration. Possible strategies are initiatives involving local schools, Neighbourhood Watch, Local Councils and the Police Authorities. Physical measures include the use of anti-graffiti coatings, special cleaning materials, grit blasting, and the provision of alternative surfaces such as tiling, and murals.

Care must be taken to ensure the compatibility of applied materials and cleaning techniques, with the structural substrate, and to avoid surface deterioration. The remedial action should not encourage further graffiti (e.g. overpainting with light coloured coatings is often seen as providing a 'new blank canvas'). More information is provided in 'The Appearance of Bridges and other Highway Structures' (Highways Agency).

3.5.3.2 Drainage

The correct operation of drains or drainage holes in a structure is essential to avoid the accumulation of water that promotes either corrosion or other deterioration. The correct operation of flap valves and other components must be checked and they must be greased where required.

It is essential that weep holes and other forms of ground drain function correctly to avoid the build-up of ground water pressure and, hence, structural instability. Particular attention must be paid to the free drainage of drainage holes in the base of HDA, BACO and other aluminium parapets, to guard against the risk of exposure by inspection and maintenance personnel to localised explosion posed by a build up of hydrogen gas. Any posts that show signs of pressure build-up must be treated by an approved method unless it is safe to clear the blocked drainage hole in the post above the weld line. Details of the requirements for inspections and repairs are contained in Chapters 2.12.3 and 3.7.2.4

It is advisable to clear drainage channels after leaf fall and ensure they are working properly before the winter starts (e.g. December). Access restrictions may prevent the effective rodding of all drainage pipes and consideration should be given to the implementation of capital maintenance works to facilitate this operation.

It is advisable to clear vegetation before the growing season (e.g. April). In some areas it may be more appropriate and effective to apply a chemical spray on to the vegetation. Expert guidance on the chemicals available must be obtained.

The complexity and accessibility of below deck drainage systems will vary considerably and a maintenance interval must be agreed with the Service Manager.

3.5.3.3 Cleaning

Attention should be paid to clearing debris from bearings, bearing shelves and flanges. For cleaning large expansion joints with provision for access from below the deck, low pressure water jetting should generally be used.

Bridge washing to remove contaminants is likely to be introduced for some specific bridge types. Adaptation of the specification for low pressure jetting for drains (see Chapter 3.3) may be appropriate.

3.5.3.4 Culverts

Many culverts can tolerate some silting and vegetation growth before efficiency is impaired to the point where the culvert needs to be cleared. Indeed disturbance of the natural stream bed may interfere with promoting natural conditions for fish etc. Before cleaning takes place, advice from an ecologist on the possible presence of protected species, including the locations of SSSI, must be sought.

Similarly the replacement of gap sealants is often difficult to undertake in water carrying structures. For example, the widest gaps will be found in the invert caused by longitudinal settlement and will be covered by the stream bed and water. Replacement is often only feasible during major refurbishment works.

Grills fitted across the ends of some culverts are particularly prone to blockages, restricting the free flow of water through the culvert.. This may be due to seasonal effects such as build up of leaves or debris that accumulates on a periodic basis. Particular attention should be paid to the maintenance of culverts with this arrangement to ensure that the free flow of water is maintained.

3.5.4 The Management of Sub-Standard Highway Structures, Concrete Half Deck and Hinge Deck Structures

3.5.4.1 Background

The Highways Agency is concerned that contemporary records of interim measures for the management of sub-standard structures are not always being expeditiously fed in to SMIS. Similarly, there is concern that management programmes for concrete half joint and hinge deck structures are not being taken forward expeditiously and, again, that contemporary records within SMIS are neither complete nor up to date. Such concern have arisen following the recent failure of major highway structures in Canada, the USA and elsewhere in the world and the lessons learnt. Further background information on those failures and findings is included at Annex [3.5.1](#).

3.5.4.2 Sub-Standard Highway Structures

The requirements for the identification, assessment and management of sub-standard structures are defined in DMRB standard BD 79 (The Management of Sub-standard Highway Structures) and BD 21 (The Assessment of Highway Bridges and Structures). The requirements of the former, which was published in August 2006 as a replacement for BA 79 of 1998, should now be well established within the UK. BD 79 covers the safe management of sub-standard highway structures including requirements and guidance on the use of interim measures during or following the assessment process. Such interim measures, crucial for the management of such structures, may include load reduction, monitoring, risk analysis or further assessment or a combination of these, together with appropriate Technical Approval procedures and requirements for auditable documentation and record keeping.

Further guidance on interim measures can be found in Volume 4 - Operational of the SMIS Help guide.

3.5.4.3 Concrete Half Joint and Hinge Deck Structures

The vulnerability of concrete half joint and hinge joint structures has long been recognised and their management is covered by CHE Memoranda 132 and 177 and CHE Memorandum 126/03 respectively together with the associated IANs 53/04 and 51/03 for Highways Agency structures. The assessment of concrete half joints is covered by BA 39. A new Advice Note on the assessment of hinge deck structures is expected to be published.

These several documents set out clear requirements for the identification, inspection and testing, assessment, risk analysis and management of concrete half joint and hinge joint structures together with the entry of record information into the Structures Management Information System (SMIS).

Further guidance on longer term management strategies has still to be issued, and new non-destructive testing methods are under development by academia and industry.

3.5.4.4 Instruction

To address the above issues, Service Providers are reminded they must:

- review and update Interim Measures for the management of substandard structures for their Network and keep this data regularly maintained in SMIS to provide an auditable record
- ensure that Interim Measures are added/updated in SMIS within one week of any change on

the Network and that the expected end date is revised should the Interim Measure be expected to remain in place for longer;

- ensure that Interim Measures are deleted from SMIS within a week of being removed from the structure;
- comply with all the requirements of the several documents relating to concrete half joint and hinge deck structures;
- ensure that all relevant bridge record information for sub-standard highway structures, concrete half joint and hinge deck structures is gathered, held and maintained within SMIS.

3.6 Tunnels**3.6.1 General**

This section contains a summary of the main aspects of tunnel operation and routine activities. For further advice on operational, maintenance and emergency procedures, reference should be made to BA 72 Maintenance of Road Tunnels and BD 78 Design of Road Tunnels. Requirements for the inspections, records, recording incidents and emergency exercises are contained in BD 53, Inspection and Records for Road Tunnels.

All reporting must now be in SMIS (Structures Management Information System) not on forms in BD53

Aspects of condition that may affect the performance of the structure and mechanical and electrical equipment are covered in BA72 and those of other components (e.g. paved areas) are in the appropriate sections.

Consideration needs to be given to the likely presence of protected species, in particular bats, in tunnel. Appropriate advice must be sought from an ecologist or the Regional Environmental Advisor, before commencing work, which may be subject to DEFRA licensing, if their presence is confirmed. If bats are discovered during maintenance work, work must cease immediately and advice sought.

3.6.2 The Road Tunnel Safety Regulations 2007

The regulations apply only to road tunnels over 500m in length and that form part of the trans-European road network (TERN). The requirements are additional to those in BD78 and BD53. An IAN describing how the Highways Agency intends applying these regulations will be issued.

3.6.3 Operation

The three main areas of responsibility for the operation of tunnels are routine traffic management, equipment operation and maintenance, and emergency response. The allocation of responsibility must be set out in the tunnel Operation and Maintenance Manual (O & M Manual).

An O & M Manual must exist for each tunnel and its specific requirements must generally be followed, along with any manufacturer's recommendations for mechanical and electrical equipment. However, the tunnel operator must review the tunnel operational, emergency and maintenance procedures and update the O & M Manual accordingly. This must be carried out periodically and following any serious or disruptive incident. Records of tunnel performance must be reviewed. The review process must include updating risk assessments, reviewing emergency procedures and liaising with the emergency services.

3.6.4 Cleaning

Cleaning of the tunnel structure (including any cladding systems) is necessary to maintain the required level of light reflectance from the tunnel walls, to reduce the build up of corrosive, toxic and flammable deposits and create a favourable impression for the road user. General sweeping, cleaning and litter clearing needs to be co-ordinated as fully as possible with wall washing.

3.6.5 Ventilation

Tunnel mechanical ventilation systems are designed to supply fresh air to all parts of the tunnel, maintain vehicle exhaust pollutants below prescribed limits of exposure (both inside the tunnel and in the vicinity of portals) and visibility and to control smoke and heat in the event of a fire. Trigger levels for the tunnel sensors for carbon monoxide (CO) and visibility (carbon particle) will be set out in the O & M Manual, based on the exposure limits given in BD78. Exposure limits for oxides of nitrogen (NO_x) given in BD78 are no longer applicable following withdrawal by HSE of mandatory exposure limits relating to this pollutant. Instead, there is a requirement to control exposure. HA commissioned research report titled 'Impact of revised HSE NO_x standards on road tunnels' provides information on best practice to limit exposure for a range of tunnel users.

3.6.6 Lighting

Tunnel lighting is required to maintain a base level of lighting within a tunnel and enhanced lighting in the tunnel entrance and exit zones in daytime, such that design traffic speeds can be safely maintained. Tunnel lighting is automatically controlled according to the exterior light levels. Current standards for lighting of highway tunnels are defined by BS 5489. A regime of cleaning luminaires and lamp replacement is necessary to maintain the required levels of lighting.

3.6.7 Drainage

Discharges into the tunnel drainage system following tunnel cleaning or an accidental spillage may contain contamination. The drainage system normally includes a separate system for the containment of spillages and discharge of tunnel cleaning effluent to foul sewers or impounding sumps. The maintenance and operation of these facilities play a key role in preventing the pollution of ground and surface water.

Where the drainage is by pumping, the regular cleaning of the traps is essential to protect the pumping equipment from the entry of solids.

Separate drains may have been fitted to collect ground water from behind the tunnel lining or any cladding. These drains may require specific maintenance.

3.6.8 Paved areas

The running surfaces in tunnels need to receive particular attention during inspections. Occurrences to consider are rutting, as flammable liquids may accumulate following a spill, lane centre oil drop accumulation and areas where leakage drips or runs on to the carriageway may reduce skid resistance.

3.6.9 Slope and ground stability adjacent to portals

Some tunnels have natural or cutting slopes in the area adjacent to or above the tunnel portal. Any instability of these slopes may pose a threat to the road user and to the integrity of the portal zone of the tunnel. Procedures for geotechnical assets need to be followed as appropriate.

3.6.10 Tunnel corrosive environment

In planning maintenance activities, it is necessary to take account of the corrosive nature of the tunnel environment. This can be caused by the concentration of vehicle exhaust fumes and corrosive anti-icing/de-icing salts which become deposited as a fine powder in all parts of the tunnel, having been blown in or carried into the tunnel by vehicles. To minimise the corrosive effects, it is recommended that spreading of corrosive anti-icers/de-icers is interrupted near to and within tunnels such that no corrosive material is spread within the tunnel or within 200m of the tunnel entrance or exit. Alternative anti-icing/de-icing materials need to be considered in these locations.

3.6.11 Anchors and mechanical supporting systems

Regular inspection of anchors and mechanical supporting systems used to support equipment is necessary. Failures may be from corrosion, local structural deterioration, vehicle strike or vibration. Refer also to the IAN 104/07 'The anchorage of reinforcement and fixings in hardened concrete'.

3.7 Road Restraint Systems**3.7.1 General**

The criteria for the provision and design guidance for Road Restraint Systems (RRS) can be found in TD19/06 Requirements for Road Restraint Systems. TD19/06 supersedes all or part of previously relevant standards in respect of RRS, including IRRRS (Revision 1) and must be used for all new highway work and maintenance renewal schemes (for details of superseded and amended documents refer to TD19/06, Lists A and B. For minor maintenance replacement works (e.g. due to accident damage) the use of TD19/06 is not mandatory. For further exceptions refer to TD19/06 Chapter 1, Implementation.

Examples of conditions that are likely to affect the performance requirements of Road Restraint Systems (RRS) include:

- Rotten wooden components that affect the function of the RRS (Wooden post safety barriers must be replaced).
- Corroded metal that affects function or promotes deterioration.
- Concrete cracking, spalling or reinforcement corrosion that affects the function or promotes deterioration.
- Missing components.
- Broken, deformed or cracked components that affect function or promote deterioration.
- Loose nuts, bolts and other components may represent a hazard or promote deterioration.
- Lack of tension in tensioned systems.
- Incorrect height.
- Excessive under growth, weeds or build up of detritus in verge or central reserve.
- Ingress of water to post sockets.

Site uniformity should be retained by maintaining the RRS to the same physical appearance as the adjacent RRS, unless the adjacent systems are obsolete.

Intervention levels and elements that should be checked for RRS include:

- Road Restraint Systems are installed at the correct height in accordance with the manufacturers recommendations.
- Components are the correct type.
- Nuts and bolts are to the required torque.
- Hollow sections drain freely.
- Tensioned vehicle restraint systems are tensioned in accordance with the manufacturers recommendations.
- Checks on the advance length of a RRS in front of or around a hazard are required to determine whether the RRS is in accordance with standard (there is always the possibility that the hazard may have been re-sited following accident damage and the length of RRS on the approach and departure do not meet standards).
- In the process of tensioning RRS, anchorages must be inspected for evidence of movement which can result from a change in ground conditions.
- The set-back distance determines the reference datum for measurement of the mounting height of safety barriers. For more details on these parameters reference should be made to the relevant standards and the manufactures recommendations.

3.7.2 Repairs and Maintenance**3.7.2.1 Requirements**

For detailed advice on the installation, repair and maintenance to RRS types Untensioned Corrugated Beam, Tension Corrugated Beam, Open Box Beam, and Rectangular Hollow Section refer to BS7669 Part 3 'Guide to the installation, inspection and repair of safety barriers' and the manufacturers recommendations. Retensioning of Tensioned Corrugated Beam must be carried out at two yearly intervals and preferably in conjunction with two yearly detailed inspections. Note that when retensioning Tension Corrugated Beam all post screws must be replaced. Retensioning must be in carried out in accordance with the procedures set out in BS 7669-3. Any contract specific requirements for repairs and maintenance should be specified in the Service Provider's contract. For information relating to other proprietary systems the manufacturer's recommendations should be referred to. Reference should also be made to MCHW Volume 1, SHW Series 400 and MCHW Volume 2 Series NG400.

3.7.3 Lane Restrictions at Barrier Repairs**3.7.3.1 General**

A risk management approach has been developed for the management of safety fence/barrier repairs, in order that a more appropriate balance is struck between the risks posed by the damaged barrier to road users and the risks posed to road workers and road users when repairs are made. It also takes account of disruption, potential loss of capacity and delay that may be incurred due to lane restrictions, particularly during peak hours.

The risk based decision process for the replacement of damaged safety barriers replaces the 24 hour rule for Category 1 defects.

3.7.3.2 Risks

Barriers are required to either mitigate the risk that a hazard may pose to the travelling public, third parties or to protect an asset from being damaged. Safety barriers in the central reserve protect the travelling public from hazards as well as from opposing traffic, whereas verge barriers normally only protect traffic from hazards (unless near a bridge approach which protects a railway/road).

If a central reserve barrier is damaged, but is still operative, it will retain some of its protective ability, and it may be appropriate to leave it until its repair or replacement can be carried out at a time that will cause minimal disruption or delay to traffic, and minimal risk to road workers, i.e. off peak, or combine the repairs with other planned works.

A risk assessment approach to identify an appropriate repair time will be used and statistics support this. Over a 20m length of barrier, accident data suggests, the probability of an accident in the central reserve that causes injury is roughly 1 in 2000 per day. The probability of a damage only accident is roughly 1 in 300 per day. Depending on the nature of the damage to the central reserve barrier the risks of not repairing the barrier for 1 to 3 days is quite low (i.e. after 3 days the probability of an accident causing injury at the same 20m section of barrier is roughly 1 in 500).

Similarly, probability of accidents are dependent upon the length of the barrier damaged, with the shorter the length affected the lower the probability. Data gathered from Area 3 has shown that the lengths of accident damaged sections of barrier is typically short, falling into the following length bands:

64% <10m
18% 10-20m and
18% >20m

3.7.3.3 Requirements

The Service Provider must ensure that works sites are as safe as practicable for all staff, road users and others, both before works can start, during works and when activities are suspended for any reason. They must also ensure that any disruptions are minimised, which may create new delays and/or dangers to traffic flow or other parties, even where these disruptions may occur at some distance from an incident site.

Whilst damaged sections of safety fence and barrier must be corrected or made safe as soon as possible, rigidly trying to carry out the work within a 24 period may not give the best balance of risk to road users or road workers. The time period in which the barrier is repaired or temporary mitigation measures used must be based on a risk assessment of the site. The probability of an accident causing injury at the same 20m section of barrier increases the longer that barrier is left and the higher the initial risk. Permanent repairs at high and medium risk sites should therefore ideally be carried out within 7 days but at a time that will cause minimal disruption or delay to traffic, and minimal risk to road workers, i.e. off peak, or combine the repairs with other planned works. Where it is expected to be impractical to carry out the permanent repairs within 7 days, the risk assessment and any associated mitigation measures must be reviewed and recorded to ensure they are still appropriate.

The risk based decision process below is intended to provide a recommended basis for making a judgement about the balance of risks at individual road works sites, involving associated traffic management, when repairing damaged safety barriers. The risk based decision process must be used in order to ensure a wide and balanced assessment of the potential risks. The aim is to ensure that the Highways Agency's roads are kept as safe and congestion free as possible for users and risks to the workforce and third parties are minimised.

3.7.3.4 Risk Assessment for Lane Restrictions at Barrier Repairs

Risk is a combination of the probability of an accident occurring and the severity of that accident should it occur.

The table below gives an overview of the factors that can affect the risk at a site and an indication of associated risk levels. It remains a matter for professional judgement whether the presence of layout aspects such as bends or junctions will change the balance indicated in the Table and local decisions should then be made on those grounds. The scores from the table for the features of a particular incident location must be added to give an indication of the risk.

	Accident Site	High	Med	Low
	Risk Probability Factors			
1	High traffic flow: > 30k/carriageway/day	3		
2	- - -: 20-30k/carriageway/day		2	
3	- - -: < 20k/carriageway/day			1
4	Barrier flattened: gap > 20m	5		
5	- - -: gap 5 - 20m		3	
6	- - -: gap < 5m			2
7	Barrier standing, extensive damage (> 10m)	3		
8	Barrier standing, extensive damage (<5 m)		2	
9	Barrier standing, minor damage			1
10	Accident history at site/location	5	3	1
11	Location near a major junction or tight curve	3		
		>13	12-5	4
	Risk Severity Factors			
12	Feature behind barrier would be vulnerable (e.g. weak structure) and if struck could cause a secondary incident	2		
13	System used to protect 3 rd parties, i.e. (central reserve barrier, bridge approach over road/rail, embankment near school etc)	5		
14	HGV Flow : High (>15%)*	3		
15	- - - : Average (12-15)*		2	
16	- - - : Low (<12%)*			1
17	Traffic speeds: Cars - Ave ≥ 120kph (75mph)	3		
18	- - - : Cars - Ave 80 -120kph (50 – 75mph)		2	
19	- - - : Cars - Ave < 80kph (50mph)			1
		>11	10-2	2
	Total Risk (aggregate score)	>24	23-13	<13

* Note: quite often freight/HGV flow is highest off-peak and therefore this must be taken into consideration

High Risk Sites: Where the aggregate score for an incident is ≥ 24 points then the location is classed as high risk (high consequence and probability) and some immediate mitigation measure must be considered, ideally repair to the barrier within 24hrs. It is important to ensure that both the resource and barrier stock is available to ensure this can happen. If this is not possible then the most appropriate mitigation measure must be taken.

This mitigation may be in the form of lane closure (or hard shoulder closure) and temporary speed limit. It should be noted that a lane closure, whilst it may provide some mitigation due to the additional distances to be travelled by an errant vehicle, is not a substantive protection and may be little difference from close coning of a site. At peak times a lane closure can cause associated congestion and accidents and public dissatisfaction and ideally should not be used if no work is to be carried out. Another solution if repair cannot take place promptly is to install a temporary barrier; this can offer an overall lower risk solution. If a temporary barrier is required, it may be preferable to

locate it adjacent to the damaged section to allow full lane usage and then relocate it when works need to be carried out.

The solution should ensure that the resultant risk at the site is as low as is reasonably practicable to the road users, any maintenance operatives and any 3rd parties that may be affected. The probability of an accident increases the longer the site is left but this increase in risk needs to be balanced against immediate repair during peak times and road worker safety if carrying out the repairs at night / in poor weather when maintenance operatives are most vulnerable.

The solution will depend on the length of time to repair / replace the affected system.

Medium Risk Sites: Where the aggregate score for an incident is between 23-13, the risk is medium and the probability of a secondary incident is much reduced. The aim is still to repair the barrier as quickly as possible but this may be in excess of 24hrs. If immediate repair cannot be carried out, appropriate mitigation until this can occur.

The mitigation may include; fully cone the gap, advance warning and/or advisory speed limit signs when left to await repair works (this will reduce the severity of an incident). A full lane closure in this situation could increase the overall risk by increasing the risk of associated accidents due to increased congestion.

Low Risk Sites: Where the aggregate score for an incident is <13 then the site is classed as low risk (the probability and severity are both low). The aim is still to repair the barrier as quickly as possible but this may be in excess of 24 hours. If immediate repair cannot be carried out, appropriate mitigation must occur

Examples are, the central reserve barrier has minor damage over a small section or a short section of verge barrier is damaged. Immediate repair may offer little benefit and mitigation may include coning the gap only or may include no action until traffic is low.

Examples:

(A) 4 panels of a central reserve barrier on a busy motorway are flattened and the gap is approx 20m (normally only occurs when there is a cross over accident). The HGV usage is average. There are no other hazards in the central reserve, no accident history.

Risk Probability Factor = 8 (medium), Risk Severity Factor = 10 (medium), overall risk =18 (medium).

(B) 4 panels of a central reserve barrier on a busy motorway are flattened and the gap is approx 20m. The HGV usage is high. There are no other hazards in the central reserve; the site has had 2 previous accidents.

Risk Probability Factor = 13 (High), Risk Severity Factor = 11 (High), overall risk =24 (high).

(C) 2 panels of a central reserve barrier on a busy motorway are damaged and the area is approx 15m. The HGV usage is average. There is a weak bridge support upstream of damaged system; the site has had no previous accidents.

Risk Probability Factor = 8 (Medium), Risk Severity Factor = 12 (High), overall risk = 20 (Medium).

(D) 3 panels of a verge barrier on a busy motorway are damaged, and the area is approx 15m. The HGV usage is average. The location is near a junction. There is a signpost that is exposed (but if struck would cause no secondary incident). The site has had 1 previous accident.

Risk Probability Factor = 12 (Medium), Risk Severity Factor = 6 (Medium), overall risk =18 (Medium).

3.7.4 Dealing with fluid & gas build-up in aluminium parapets

Inspection and maintenance personnel may be exposed to a localised explosion risk due to the presence of hydrogen gas when drilling or dismantling an affected area.

Inspections (2.12.3) will identify the location of potential sites and examine any posts that exhibit or have the potential to exhibit signs of pressure build-up e.g. wall bulging, blocked drainage holes, white fluid or horizontal cracks above the base plate.

If a post exhibits any signs of pressure build-up it needs to be treated using an approved method unless it has been possible to safely clear the blocked drainage hole in the post above the weld line (3.5.3.2). It may be possible to safely drill at the base of the post using compressed air tools, suitable spark free equipment and PPE but in any event it will need to be carried out under an approved method statement.

Posts that are found to be cracked must be replaced as soon as is reasonably possible with new posts incorporating correctly placed drainage holes (10mm diameter holes above the weld line, clear of the mortar bed).

Details of the requirements for inspection and routine maintenance are contained in Chapters 2.12.3 and 3.5.3.2 and records must be reported to the Highways Agency Area Performance Manager.

3.8 Highways Agency Traffic Management Systems

3.8.1 General

HATMS is a new term that embraces both the traditional systems associated with Police control offices along with other roadside technology used by the Regional Control Centres (RCCs) and National Traffic Control Centre (NTCC) for the provision of traffic information and traffic management. The term helps to distinguish these systems from the other 'communication' systems introduced during the RCC roll out (see below).

The main roadside devices associated with HATMS are emergency roadside telephones (ERT's), signals, message signs, Motorway Incident Detection and Automatic Signalling (MIDAS), CCTV Cameras and Meteorological Outstations (there are currently two types of meteorological outstations, viz. fog detectors and anemometers). The MIDAS subsystem detects traffic conditions and automatically sets message signs and signals appropriately. The CCTV System provides dynamic images of the Highways Agency's Core road network (in locations where it is available) into the RCC. It allows operators to switch and position cameras, as well as to view and set access priorities and restrictions for 3rd party users such as, Police Forces, media organisations and Local Authorities.

3.8.2 Maintenance Aspects

The maintenance arrangements for HATMS vary significantly across the country. A list of the main technology systems covered and a top-level explanation of the different arrangements are given in this section. The local contractual arrangements will give details of the maintenance requirements for the area and these must be referred to. These, in turn, will likely refer to detailed requirements within the National Motorway Communications System (NMCS) documents which can be accessed at the Plans Registry website (www.tssplansregistry.org). A List of Drawings, Specifications and Instructions within the website are contained in the MCS206 document. Alternatively documents may be requested by post, fax or email.

3.8.3 Requirements for NTCC & TiS equipment

The NTCC is operated by TiS Ltd (TiS) on behalf of the Highways Agency through a private finance initiative contract, which was awarded in March 2001 for a period of 10 years. Equipment which is owned and operated by TiS on the Highways Agency's Network as part of this service include:

- Inductive Loops and Traffic Monitoring Units (TMU)
- MIDAS
- Automatic Number Plate Recognition (ANPR) cameras
- National Motorway Communication System (NMCS)
- Variable Message Signs (VMS) and Local Communications Controllers
- TCC Interface (TCCI) and Video Access Control (VAC) Sub-system
- CCTV Installations

Failure by others to maintain or replace faulty equipment may mean that the Highways Agency pays for a service which TiS are unable to deliver. Service Providers have obligations to help prevent such a situation occurring.

In the event of any anticipated temporary or permanent loss of TiS equipment due to works carried out by or on behalf of the Service Provider (e.g. carriageway resurfacing that removes loop detectors; bridge parapet repairs requiring removal of ANPR cameras; traffic management that interferes or affects flow of traffic across TiS equipment) the Service Provider must provide at least one calendar month's notice to NTCC and the relevant RCC of any such works and their expected impact

Contact details for notification of works to TiS is:

Head of Engineering
3 Ridgeway
Quinton Business Park
Quinton
BIRMINGHAM
B32 1AF

NTCC Switchboard 0121 245 4800

Service Providers must allow for loop reinstatement costs in their works estimates and bid for funds accordingly. They must also replace loops in accordance with the relevant specification, obtainable from TiS. Further more they must allow for the costs of attendance by TiS to disconnect or reconnect loops plus an amount for each lane on which the loops are to be connected (£140 and £50 respectively at June 2006).

3.8.4 Regional Control Centres

The Highways Agency has implemented a network of seven Regional Control Centres (RCCs) across England. The RCCs cover motorways and some key trunk roads within each region of the country. Over time their operations may be extended to the entire core network. The technology employed in the RCCs may be split into two types: - that employed to manage and control the roadside equipment in the RCC area (see NRTS below) and other technology used to provide communications with and manage the on-road resources of the Highways Agency Traffic Officer Service. The other technology systems include the Operational Telephony System, Airwave System, Integrated Communication Control System and the Command & Control System. The other technology systems are not further described here because the maintenance of these systems is handled by separate service level agreements which are handled at a National level.

3.8.5 TechMAC

As well as the service providers described in the Introduction to this manual (e.g. MAC, EMAC, DBFO) there is also the TechMAC (Technology Maintaining (Managing) Agent / Contractor) Contract. This can provide an integrated technology network management, maintenance, renewal and improvement service for the technology associated with the strategic (core) motorway and trunk road network.

3.8.6 National Roads Telecommunications Services (NRTS)

Following increasing demands on the NMCS communications network to support extra roadside devices and new systems and facilities, the NRTS initiative was conceived to provide a single, national approach to the future development of the telecommunications network and the provision of telecommunications services.

The NRTS Contractor has full responsibility for the national telecommunications network and is responsible for providing a resilient and reliable service, and for monitoring the performance of telecommunications services. The Highways Agency appointed GeneSYS Telecommunications Ltd (GeneSYS) as its NRTS Contractor on 16th September 2005. They have responsibility for the telecommunications network for a period of 10 years. GeneSYS Co provides a "one stop shop" for the Highways Agency's operational telecommunications needs. NRTS Co will gradually take on responsibility for the maintenance of the National Transmission network.

Based on the new arrangements GeneSYS provides end-to-end responsibility for transmission services, while the responsibility for roadside devices and RCC applications remains with the

Highways Agency. This means GeneSYS are responsible for monitoring the performance of the transmission services, for providing a resilient and reliable service and for providing additional local connections to support additional roadside devices.

From the Highways Agency's perspective GeneSYS provide a service capability for conveying voice, video and data signals that link the Highways Agency's roadside devices to the RCCs. NRTS separates the procurement of roadside communications services from road schemes.

As part of their one-stop-shop approach, GeneSYS provide services based on a fixed price catalogue, while looking at the effects of individual projects on the telecommunications network as a whole. This allows scheme consultants to budget with certainty of price and allows GeneSYS to design changes so as to optimise the network capacity strategically.

3.8.7 Design and installation of the telecommunications network by GeneSYS

Smaller Schemes (LNMS) and Technology Schemes may have an effect upon the telecommunications network. Service Providers may act as designer to develop these schemes and contractor to implement them so should be aware of the responsibilities held by GeneSYS relating to the telecommunication network and explained below.

3.8.7.1 Transmission Design

GeneSYS works collaboratively with scheme designers from initial conception. They will provide advice on transmission routing, capacity planning and pricing. GeneSYS are responsible for designing cabling and transmission equipment between standard demarcation points, termed Service Delivery Points (SDPs). For roadside devices the SDP is generally in the cabinet alongside the roadside device. A standard list of prices for the transmission elements of schemes and definition of SDPs is available from GeneSYS.

Service Providers must contact GeneSYS at the earliest opportunity for any schemes, for which they have responsibility, which either require new services, or alterations to transmission services, or will affect any aspect of the Highways Agency's transmission network.

3.8.7.2 Transmission Installation

GeneSYS is responsible for the installation and testing of cabling and transmission equipment for all schemes up to the SDPs.

3.8.7.3 Civils Infrastructure

Detailed design and installation of telecommunications ducts, chambers, ducts through structures, cross carriageway ducts and transmission stations may be carried out by GeneSYS or the Service Provider (as designer / contractor). Design and installation must be in accordance with the NRTS standards, available from GeneSYS.

3.8.7.4 End devices

Responsibility for the design, connection and installation of end devices to SDPs remains with the scheme contractor. Such end devices typically includes signals, VMS, MIDAS detectors, ERTs and CCTV cameras.

3.8.7.5 Maintenance / installation affecting Transmission Network

Service Providers must obtain agreement from GeneSYS prior to undertaking any maintenance / installation works which may affect the Highways Agency's transmission network.

3.8.7.6 GeneSYS contact details

Contact details for GeneSYS are:

GeneSYS Telecommunications Ltd
9 Ridgeway
Quinton Business Park
BIRMINGHAM
B32 1AF

GeneSYS Helpdesk
Tel: 0845 603 2239 (24 Hours)
Fax: 0121 506 6120
E-mail genesys.noc@fluor.com

Contact details for Regional Managers may be obtained from the GeneSYS helpdesk.

3.9 Road Markings and Road Studs

3.9.1 General

Road markings and studs are defined and prescribed in The Traffic Signs Regulations and General Directions and further detailed in supporting documents (e.g. Working Drawings and Chapter 5 of the Traffic Signs Manual). Markings outside the scope of these Regulations (e.g. speed camera calibration markings and dragon teeth markings) are treated as special markings but for maintenance purposes are dealt with in the same manner as normal markings.

Many road markings are used to give effect to regulatory provision; it is important that their legal status is not affected by undue wear or damage. Examples of Category 1 and Category 2 defects are stated in TD26.

Details of the requirements for inspection type and frequency and reporting of the condition and any defects of Road markings and road studs are specified in TD26.

3.9.2 Road Markings

Aspects of condition that may affect the performance of road markings (paint or thermoplastic) and are required to be inspected are contained in TD 26 and summarised as:

- Retroreflectivity (R_L)
- Wear
- Discoloration and reduction in the luminance factor
- Skid resistance (SRT)
- Annually approved high speed monitors must be used for longitudinal road markings in long lengths of the network
- Correlation between high speed monitor and handheld retroflectometer is given in Annex H
- For all-purpose roads where high speed monitors are not suitable, visual assessment scoring system – see Annex C
- Records and Inventory are given in TD 26 Section 5, particularly note annual reports are required

NB: For further information see BS EN 1436.

3.9.3 Road Studs

Aspects of condition that may affect the achievement of the performance of road studs and are required to be inspected are contained in TD 26 and summarised as:

- Wear, corrosion, damage
- Loose and missing studs and/or inserts
- Loss of or damage to retro-reflective lenses
- Sinkage (see TD 26 for details)
- Settlement (see TD 26 for details)
- Detritus on lenses
- Integrity and security of “embedded” studs (housings)
- Loss of adhesion or breaking up of surface mounted road studs
- Misalignment with existing road markings

- Studs that do not meet the requirements for luminous intensity
- Studs that do not meet the requirements for reflective conspicuity.
- Records and Inventory are given in TD 26 Section 5, particularly note annual reports are required

3.10 Road Traffic Signs**3.10.1 General**

The Standards and full advice for maintenance of road traffic signs installations are contained in TD25. Statutory requirements for signs, including the removal of temporary signs, are stated in the Traffic Signs Regulations and General Directions.

Many signs are required to be lit and their legal status is affected if the illumination has failed. It is important that such failures are detected and rectified promptly.

Aspects of condition that may affect the performance of road traffic signs are contained in TD 25 and summarised as:

- Visual performance, electrical safety and operation and structural integrity
- General cleaning of signs
- Incorrect orientation, damaged or missing
- Loss of surface/paint/legend from peeling, damage or vandalism
- Reduction in the retro-reflectivity of white sign face materials
- Degradation of coloured sign face materials
- Lamp failure, lamp on during the day, photo-electric circuit or time switch failure, electricity supply failure, no fuse, lamp dirty or output low
- Moving parts of secret and variable message signs malfunction – see MCH 1553
- Wiring deterioration, discontinuity of protective conductors, earth electrode failure, earth loop impedance failure, inadequate insulation resistance, missing drawings, condition of sealant, polarity failure, residual current device failure.
- Wiring in hazardous condition
- Access for maintenance blocked or security of the equipment breached
- Corrosion/deterioration or damage to plate, fittings, frame or post
- Records and Inventory are given in Chapter 7, particularly note annual reports are required

Details of the requirements for the maintenance of traffic signs with dew resistant coatings is shown in section 3.10.2 below.

3.10.2 Maintenance of Traffic Signs with Dew & Graffiti Resistant Coatings

Traffic signs with dew resistant coatings must be maintained in accordance with the requirements of IAN 56/04.

3.10.2.1 Required Action

Contractors responsible for cleaning traffic signs must ensure that under no circumstances detergents, abrasive sponges, high pressure water jet or brushes be used to clean signs with dew resistant coatings. When such signs require cleaning only clean water from a low pressure hose must be used.

Signs with dew resistant coatings are unlikely to require cleaning as frequently as other signs.

3.10.2.2 Traffic Signs with Dew & Graffiti Resistant Coatings

There are two types of sign face with dew resistant coatings; one supplied by 3M UK plc and the other by Rennicks (UK) Ltd.

The signs are identifiable by a label on the rear of the sign that reads:

Warning: Sign face coated with self cleansing dew resistant overlay & should not require cleaning.

3.11 Road Traffic Signals

3.11.1 General

The standards currently utilised for maintenance of road traffic signal installations are detailed in TD 24 and TA84. Statutory requirements for signals are stated in TSRGD. Reference should also be made to the Guidance on signal head optics for advice in connection with light source replacement and innovation. During emergencies or incidents it may be necessary to reduce response times. There may be instances where the maintenance of traffic signals on the network is not the responsibility of the Service Provider, but an adjacent highway authority. The responsibility for such maintenance must always be clarified.

There will be occasions when a failure of a set of signals, whilst not sufficient to invoke a full scale emergency, may cause significant problems. In order for such incidents to be dealt with effectively the Service Provider must develop a 'Traffic Signal Failure Plan'. This plan will detail the Service Provider's actions to mitigate the effects of the failure during the hazard mitigation period in order to maintain a reasonable flow of traffic through any junction until such time as the permanent repair is carried out.

Aspects of condition that may affect the achievement of the performance requirements for road traffic signals are contained in TD24 and TA84 and summarised as:

- Signal failure
- Operation of signal heads, control equipment, detectors, dimmer, push buttons, indicator lamps and audible and tactile signals
- Alignment, cleanliness and visibility of the signal head, including obstruction by trees or other vegetation
- Physical condition of poles, signal heads, support brackets and backing boards.
- Condition of any regulatory and variable message sign/illumination
- Equipment wiring and earth condition
- Condition and accessibility of equipment cabinets
- Data sheets and logbooks present in cabinet
- Damage to traffic signals and counter / loops, due to vandalism, road traffic accident damage, or excavation by Service Provider or Statutory Undertaker
- Hazards, including the presence of gas and difficulty in accessing the cabinet

3.12 Lighting**3.12.1 General**

The requirements for maintenance of lighting installations are covered by TD23 Trunk Roads and Trunk Road Motorways Inspection and Maintenance of Road Lighting. The suite of standards currently utilised for design and operation of road lighting installations incorporate the above standard and typically also include:

- TA49 Appraisal of New and Replacement Lighting on Trunk Roads and Trunk Road Motorways
- TD34 Design of Road Lighting, linked to BS 5489 and technical reports issued by the Institution of Lighting Engineers (ILE).
- BS 7671. I.E.E. Regulations. Requirement for Electrical Installations (Wiring Regulations).
- Other guidelines and recommendations, for example from the Association of Street Lighting & Electrical Contractors (ASLEC), are also incorporated into the maintenance regimes.
- Other design codes may also be included.
- TA89 Use of Passively Safe Signposts, Lighting Columns and Traffic Signal Posts to BS EN 12767
- TA96 Whole Life Cycle Code of Practice for Road Lighting (to be published in 2007)

In general, lamp replacement maintains safety, service and value for money. However, other aspects will need to be considered to ensure that overall (whole life) maintenance costs are minimised.

- Standardisation of components, where possible, to minimise the number of different components of different manufacture and types are used.
- Replacement and repair materials and equipment should have the same physical, photometric and aesthetic characteristics as existing, except where the existing is obsolete or due for replacement.
- Lights are maintained in a way that enables a continuing rapid and economic maintenance response including replacement of power factor correction capacitors.
- Lamps containing materials that can be recycled should be utilised with an aim of achieving 70% recycling. Additionally, mercury free lamps should also be used where practicable. The minimum requirements shall be full compliance with the Waste Electrical and Electronic Equipment Directive (WEEED)

Aspects of condition that may affect the achievement of the performance requirements for Lighting can be summarised as:

- Lamp failure, photoelectric circuit or time switch failure, electricity supply failure, lamp damage
- Lamp output low due to lamp being dirty, lamp ageing, voltage drop
- Lamp on during day due to photoelectric circuit or time switch failure
- Obscuring by foliage, or other signs and structures
- Incorrect orientation of the lamp due to damaged or misaligned mountings
- Wiring deterioration, discontinuity of protective conductors, earth electrode failure, earth loop impedance failure, inadequate insulation resistance, condition of sealant, polarity failure, protective current device failure, thermostat or heater failure,
- Wiring in hazardous condition
- Access for maintenance blocked or security of equipment breached
- Deterioration or damage to column, brackets or other supports - corrosion, damage or missing parts that affect function or promote deterioration

Specific guidance on defects, their categorisation and response times may be found in TD23.

3.13 Soft Estate**3.13.1 General**

The soft estate is defined as: The natural part of the highway estate including any cultural heritage assets together with hard landscaping areas (as opposed to engineering/operational part of the highway including structures, carriageway, hard shoulder and central reserve that may be constructed with concrete, bituminous materials, steel, etc.). For a list of element descriptions refer to DMRB Volume 10.

In addition to the general advice indicated below, reference should be made to Volumes 10 and 11 of the DMRB, IAN's 76/06 to 82/06, IAN 84/07 EnvIS, IAN 100/07 Cultural Heritage Management Plans, the current Highways Agency's Biodiversity Action Plan, the Highways Agency's Landscape Management Handbook HA108.

Examples of aspects of condition that may affect the achievement of the performance requirements for the soft estate are:

- Vegetation that restricts visibility along sight lines at junctions and access points and below minimum stopping distances at bends
- Vegetation that obstructs the view of signs, lights, signals and marker posts
- Vegetation that restricts access to off-carriageway refuges for road users and service providers (historically maintained by undertaking a swathe cut)
- Vegetation that restricts access to emergency roadside telephones
- Vegetation (particularly gorse) that creates a fire hazard
- The presence of unsafe trees within Area Network or within falling distance of the highway boundary
- The presence of undesired vegetation in hardened areas
- The presence of Injurious weeds
- Damage to or deterioration of protected named species and habitats
- Damage to or deterioration of special ecological measures (e.g. deer fencing, badger tunnels and bat boxes)
- Deterioration of grasslands and associated bulb planting
- Deterioration of hedgerows
- Deterioration of wetlands
- Deterioration of woodland/trees/shrubs including any associated herbaceous planting
- Deterioration of the cultural heritage asset

Routine Maintenance of the soft estate includes those operations which are required to maintain the soft estate asset in line with its element objectives and are usually carried out on a cyclical basis. These are more servicing than repair activities. Examples include:

- thinning, coppicing , pollarding of woody areas to maintain them as woody areas including any follow up operations associated with these such as applying herbicides to cut stumps or treatment of arisings
- cleaning of woody areas by removing competing woody vegetation including treatment of any arisings
- trimming hedges

- arboricultural works to trees to maintain the health and therefore safety of the tree, may also include works to make sure tree does not hinder operation of network, or to avoid nuisance to our neighbours,
- cutting/mowing/raking of grassland, to maintain it as grassland
- removal of scrub, gorse and trees including clear felling from grassland to maintain it as grassland including any follow up operations associated with these such as applying herbicides to cut stumps or treatment of arisings
- removal of vegetation from a rock face to maintain it as an open rock face
- ditch cleaning to maintain original profile of ditch to maintain drainage capability
- maintenance of other water bodies by removing vegetation, silt and other debris which conflicts with element objective
- maintenance of existing wild life fences, badgers/otters
- Removal of litter.
- Removal of injurious and noxious weeds
- Grass cutting for safety requirements, to maintain visibility to signs and access to street furniture.

Improvement to the Soft Estate includes those operations that add value to the soft estate asset by changing the element objective or which enhance areas by adding something to enable the objectives to be more effectively met. They are more repair or new operations (This would include any additions asked for by third parties and agreed to by the HA). Examples include:

- New tree and shrub planting for landscape/biodiversity reasons.
- Introducing new woody/herbaceous planting into existing woodland to add species and structural diversity or improve screening performance. This should be combined to immediately follow thinning/or clear felling operations. The first 5 years of aftercare for any new planting would be regarded as part of the Improvement i.e. weeding and beat up)
- adding a otter ledge
- adding new wildlife fencing for Otter deer badgers
- adding new dormice or bat boxes
- Adding wildflower seeding/plug planting into grassland.
- Adding bulbs into grassland or woodland
- Creating new waterbodies, either for drainage or conservation reasons

The Service Provider is reminded that any work to the soft estate is highly likely to encounter the presence of protected species (flora and fauna) which may require licenses to be in place before work can start and that appropriate advice must be sought from an ecologist or the Highways Agency's SSR Regional Environmental Advisor, before commencing work. It is likely that if found prior assessment work and licences may be required to undertake the work.

3.13.2 Access

Access to boundary fences for inspection and maintenance must be kept clear at all times.

3.13.3 Woodlands, Trees & Hedgerows

Management of trees, woodlands and hedgerows must be planned to ensure these elements fulfil their objectives and functions as defined in the DMRB Volume 10, Section 0, and as set out in the appropriate landscape management plan.

Trees are an important amenity feature of the roadside soft estate and their contribution to the environment is such that they must be retained wherever it is safe to do so. Highway trees do however have the potential to pose a threat to the safety of road users, pedestrians and to adjoining property and livestock. Any external signs of decay or deterioration must be reported by the inspector for action by a qualified arboriculturist.

Trees that lie within falling distance of the highway boundary but located outside the highway boundary and not in the ownership of the Service Manager are classified as highway trees as described in Section 154, Highways Act 1980. If such trees are found to be in an unsafe condition the Service Manager has the power to order the owner to carry out such work as may be necessary to make the tree safe. If this is not carried out by the owner within 14 days, the Service Manager has the power, in accord with the provisions of Section 154 of the 1980 Highways Act, to carry out the work and recharge the cost of the work to the owner.

However, trees beyond the highway boundary may be subject to tree preservation orders (TPO). In these situations The Highways Act 1980 may not apply and planning permission may need to be sought to remove the tree; discussion with the appropriate Local Authority Tree Officer must be undertaken.

Qualified arboriculturists must be employed by the Service Provider to carry out specialist inspections and to advise on signs of ill health or damage to trees. Care must be taken to ensure the appropriate maintenance of 'veteran trees' (trees that are of interest biologically, aesthetically, or culturally because of their age).

The following contain guidance about working close to trees:

BS5837 (1991) Guide for trees in relation to construction.

NJUG 10 Guidelines for the planning, installation and maintenance of utility services in proximity to trees.

The removal of hedgerows, particularly important hedgerows as defined by the Hedgerow Regulations 1997, is likely to be subject to a requirement for planning permission outside of the soft estate to the equivalent (ROD) within the soft estate. The removal of hedgerows is also contrary to government planning advice PPS9 and therefore must be avoided wherever possible. Removal will only be considered under exceptional circumstances and subject to expert ecological assessment.

3.13.4 Grasslands

Cutting of grasslands that are cut for visibility and safety must be undertaken to ensure that standards for visibility and sightlines, and safe off-carriageway refuges including access to emergency road side telephones, are maintained.

Non-visibility grasslands are an equally important feature of the network and will need to be managed to ensure these elements fulfil their functions and objectives as defined in DMRB Volume 10, Section 0, and as set out in the appropriate landscape management plan for the route. Failure to manage these grasslands will mean their function or objective will change with the succession to scrub invasion and then woodland which will increase the network's tree stock which will in turn increase maintenance costs.

3.13.5 Conservation Wetlands

These are defined as those water bodies which have no drainage or attenuation functions.

Conservation water bodies need to be managed by the Service Provider to ensure these elements fulfil their objectives and functions as defined in the DMRB Volume 10, Section 0, and as set out in the appropriate landscape management plan.

3.13.6 Weeds

Control of notifiable weeds (*sensu* The Weeds Act 1959 HMSO) may be necessary. It is an offence under the Wildlife and Countryside Act 1981 HMSO to cause Japanese Knotweed (*Polygonum cuspidatum*) or Giant Hogweed (*Heracleum mantegazzianum*) to grow in the wild. Care must be taken during the transport of soil or other material, which may contain parts or seeds of these plants, from one place to another as such activities may infringe this legislation.

3.13.6.1 Common Ragwort

Common Ragwort (*Senecio jacobaea*) is a widespread weed found on roadside verges, waste ground, and neglected pasture. It is one of five “injurious” weed species proscribed in the Weeds Act 1959. Where these weeds occur the Act requires occupiers of land to undertake measures to control their spread. The Ragwort Control Act inserts a new provision into the Weeds Act 1959 enabling the Minister to make a code of practice on how to prevent the spread of Common Ragwort. A code of practice is currently available on the DEFRA website (see other sources of information below) and contains very useful advice including identification of risk in order to prioritise control measures.

The tissues of Ragwort contain pyrrolizidine alkaloids, which are highly toxic to grazing animals, particularly cattle and horses and to a lesser extent sheep and goats. Ragwort poisoning is cumulative and results in liver failure and is usually fatal to animals that ingest it. It remains poisonous in its dried state and animals are frequently poisoned when they eat hay and silage containing it.

Ragwort is a biennial plant germinating in summer and autumn and forming a tight rosette of leaves before going on to flowering and seeding the following year. After seeding the plant dies. It produces heads of bright yellow daisy like flowers from late May into August, each plant producing several thousand wind borne seeds which can spread over a considerable area. Seed can remain viable in the soil for up to 20 years.

The Service Provider must be proactive in controlling injurious weeds.

Total eradication of Ragwort is not a realistic option given the ease with which highway verges can be re-infested from neighbouring land or from dormant seeds in the soil. It is recommended that within a treatment programme those areas where infestations are close to livestock or where they are heavy be dealt with first. There are a number of measures which can be used in combination to provide adequate control:

- Regular mowing: to prevent flowering (in many instances this will not be acceptable on nature conservation grounds).

- Hand pulling: generally this is the only effective method to control the weed once the plants have started to flower (at this stage they are easy to find). It must be carried out before seed has dispersed. This is a very labour intensive and therefore expensive and operatives must wear protective clothing, currently little is known about the entry of the alkaloid through the human skin. Pulled plants must be removed from site for appropriate disposal (DEFRA Code of Practice to 'Prevent and Control the Spread of Ragwort' gives good guidance on disposal).
- Spot treatment with selective herbicide spray (selective weed killers act on broad leaved plants only and leave grasses unaffected). There are a number of selective herbicide formulations that provide effective control of Ragwort but they generally need to be applied before the plant shows any colour in its flowers otherwise they continue to set and disperse viable seed. Treatment is best carried out in spring through to early summer depending to some extent on regional location. Timely herbicide application will greatly reduce the amount of hand pulling required. Care is needed to ensure that spray drift does not damage adjoining land or other broad-leaved plants such as trees and wildflowers within the highway soft estate.
- Spot spray treatment can also be carried with a formulation of citronella oil and this substance can be used to treat rosettes over a long period. Because of its formulation this material is likely to be less economical on large infestations but it may be considered to extend the period of treatment into the winter months when selective herbicides are not effective.

Service Providers can get further advice from Highways Agency Network Services regional environmental advisors.

Information on ragwort and other injurious weeds, including the Code of Practice on how to prevent the spread of ragwort, may be found on the DEFRA Website.

3.13.6.2 Control of Other Injurious Weeds

In addition to Ragwort the Weeds Act 1959 also lists Spear Thistle (*Cirsium vulgare*), Creeping Thistle (*Cirsium arvense*), Broad Leaved Dock (*Rumex obtusifolius*) and Curled Dock (*Rumex crispus*) which must be controlled. These are likely to be widespread on the highway estate. Hand pulling is not an option for these species but they can all be effectively controlled by spot treatment with selective herbicide, or in exceptional circumstances by a carefully targeted application of an appropriate contact translocated herbicide.

Under Section 14 Schedule 9 of the Wildlife and Countryside Act 1981 it is also an offence to cause the spread of Japanese Knotweed (*Fallopia japonica*) and Giant Hogweed (*Heracleum mantegazzianum*). These problem weeds occur on the highway estate but are much more localised. A concerted programme of translocated herbicide applications can effectively control them.

It must be remembered that Japanese Knotweed, and soil containing it, is classed as "controlled waste" and under the Environmental Protection Act 1990 must be disposed of safely to a licensed landfill site.

The presence of this weed on highway verges can put severe constraints on engineering and maintenance operations particularly any work that involves trenching or other form of excavation. Material containing the weed must not be moved within a site.

Service Managers can get further advice from SSR regional environmental advisors.

3.13.7 Cultural Heritage Asset

Trunk roads and their environs contain areas of considerable value for cultural heritage. Cultural heritage assets potentially affected by roads include buried remains, historic structures and historic landscapes. The guidance for Service Providers in managing these assets are set out in IAN 100/07 Cultural Heritage Management Plans. Additionally the requirements for recording these assets are included within the EnvIS system as introduced by IAN 84/07 and detailed at 2.15 of this Network Management Manual.

3.14 Sweeping and Cleaning**3.14.1 General**

The requirements of this chapter relate to the responsibilities in respect to Section 89 of the Environmental Protection Act 1990 (EPA) to ensure that the highway is, so far as is practicable, kept clean and to ensure that the land, so far as is practicable, kept clear of litter and refuse. The Secretary of State has the duty for litter and refuse on the motorway and those APTR that have been transferred back to the Secretary of State under Section 86(11) of the EPA (see Section 3.16), whilst local authorities are responsible for cleaning and removal of litter from all other APTR.

The Service Provider is responsible for discharging these responsibilities on behalf of the Secretary of State in respect of the network and in doing so must maintain the network clear of litter and refuse and in a state of cleanliness as recommended in the Environmental Protection Act 1990: Code of Practice on Litter and Refuse (Department of Environment, Food and Rural Affairs). This relates to the sweeping and cleaning of all channels and hard shoulders, clearing and removal of debris from traffic lanes, hard shoulders, verges and central reservations, removal of litter, and footway and cycle track sweeping.

This code of practice, which can be downloaded from the internet, seeks to encourage duty bodies, those with duties imposed by the EPA to maintain their land within acceptable cleanliness standards with the emphasis being on consistent and appropriate management to keep it clean rather than how often it is cleaned. It details four grades of cleanliness for which the Code defines the performance requirements.

The EPA does not contain anything that removes the responsibility of the Highways Agency to keep trunk roads safe for the travelling public. There will, therefore, be a continuing need for sweeping to be carried out by the Highways Agency's Service Providers (e.g. dealing with shed loads, spillages and accident debris).

3.14.2 Meeting the Performance Requirements

The Service Provider must adopt a proactive approach to the removal of litter and other debris from the Network in order to meet the Performance Requirements. This may be achieved using a combination of programmed scavenges, as need dictates, together with "black spot" scavenges as required in specific locations where the highway has become heavily littered as a result of other factors such as debris from vehicles or wind blown litter. If a particular source of regular litter, wind blown or otherwise, can be identified then those responsible should be requested to exercise control of their site more effectively. Such requests must be documented.

On occasions it will be necessary for emergency vehicles to drive along the hard shoulder, often at speed. It has been noted that debris on the hard shoulder, particularly metal objects can cause punctures to emergency vehicles. Therefore the use of magnetic cleaning is encouraged.

Weed and vegetation growth that is likely to obstruct the flow of water in channels or cause structural deterioration, does not fall within the scope of the EPA. Such growth must be treated in accordance with the appropriate standards.

The Highways Agency's policy is that litterbins are provided only at designated picnic sites and those lay-bys with toilets and/or picnic tables. Those sites must be scavenged as necessary.

Examples of condition that are likely to prevent the achievement of the Performance Requirements include:

- Detritus, litter, refuse, animal carcasses, debris and other objects on the Network
- Growth of grass or other vegetation between the channel and kerb, which is likely to obstruct the flow of water or cause structural deterioration.

3.15 Fences, Walls, Screens and Environmental Barriers**3.15.1 General**

There is a need to maintain a record of the purpose of fences, walls, screens and environmental barriers, so that their performance can be verified as required by the EnvIS system. The intended design and performance requirements may be described in the original contract documentation.

Aspects of condition that may affect the achievement of the performance requirements for fences, walls, screens and environmental barriers are:

- Rotten wooden elements that affects function or promotes deterioration
- Corroded metal that affects function or promotes deterioration
- Concrete cracking, spalling or reinforcement corrosion that affects the function or promotes deterioration
- Brickwork cracking, spalling or loss of mortar that affects the function
- Missing, broken, deformed or cracked components that affect function or promote deterioration
- Loose nuts, bolts and other components may represent a hazard or promote deterioration
- Lack of tension in a strained wire fence
- Too low fence or barrier (caused by subsidence or otherwise)
- Loss of paint, galvanising or other protective system
- Effects of spray and pollutants degrading colour or transparency

The appearance of fences, walls, screens and environmental barriers is important and any repairs or replacement sections must maintain the uniformity of their appearance, unless the existing is obsolete.

On all-purpose trunk roads the decision to fence land rests with the owner and occupier of the land fronting on to the highway, although in most locations he will be liable for negligence if damage is caused by his animals straying on to the highway.

The Highways Agency has no general obligation to fence off the highways to which there is a public right of access, although there is power to fence highways in Section 80, as modified, of the Highways Act 1980.

Any fencing along the boundaries of APTR is therefore generally the responsibility of the adjoining landowner/user following any agreed maintenance period after installation on new schemes. In some circumstances however, fencing for the protection of wildlife may remain the property of the Highways Agency. Because of their special status restricting general access, and high-speed characteristics, motorways need to be fenced to avoid the hazard to traffic presented by trespassers and wandering animals. It is the Highways Agency's practice to accept responsibility for the construction or erection and maintenance of the fencing along the motorway boundaries. This does not, however, absolve the adjoining landowner/occupier from the statutory obligations under the Animals Act 1971 to prevent stock from straying.

Although it is the Highways Agency's practice to provide and maintain adequate fencing, the Highways Agency does not accept responsibility for alterations to the fence necessitated by adjoining landowners/occupiers changing requirements after installation. In those circumstances it is for the landowners/occupiers to provide and maintain any additional rails/netting/wire needed to prevent the egress of animals on to the highway.

In the interests of safety, Service Providers are expected to use discretion in carrying out minor/temporary repairs on any part of the fence added by the landowner/occupier, where such parts are found to be defective as a result of inspection, or reports from the Police or public. Serious defects will need to be reported to the landowner/occupier with a request for them to be rectified. If the repairs need to be carried out immediately, in the interests of safety, the Service Provider will carry out the necessary work and make a request to the landowner/occupier for reimbursement of any substantial expenditure incurred.

Where a spate of wildlife casualties are identified on the road and in areas which fencing provisions for wildlife have already been made, the fencing in this area must be immediately inspected to identify defects with or damage to the fencing. This must be repaired immediately as appropriate to prevent further casualties. This is important from an animal welfare and road user safety perspective.

Fences designed for other special purposes, such as the security of goods or the protection of traffic from sporting activities, and installed by the owners on land adjoining a motorway, remain the responsibility of the landowner/occupier, and any serious defects must be drawn to the attention of the owner/occupier.

Where there is persistent vandalism and theft, consideration should be given to replacing the existing fence with a more substantial type, e.g. replace timber post & rail with palisade.

3.16 Retained Litter Clearing Duties**3.16.1 General**

Section 3.14 details the requirements for sweeping and cleaning to fulfil the requirements of Section 89 of the Environmental Protection Act 1990. The Secretary of State has responsibility for fulfilling the requirements on the motorway network and local authorities typically have responsibility for sweeping and clearing of APTR. Section 86(11) of the Act allows the Secretary of State to transfer responsibilities from the local authority to the highway or road authority. This chapter details those sections of road where the Secretary of State has exercised this power.

Tables 3.16.1 and 3.16.2 below detail those sections of APTR for which the Secretary of State retains the responsibility for sweeping and cleaning.

The Service Provider, under the terms of his contract is responsible for discharging responsibilities arising from the EPA on behalf of the Secretary of State for those roads listed in Table 3,16.1 where they form part of the Network.

Road No.	Description
A2	From its junction with the M2 Motorway (Junction 1) to its junction with the M25 Motorway (Junction 2).
A282	From its junction with the M25 Motorway (Junction 30) to its junction with the M25 Motorway (Junction 2).
A27	From the southern end of the A3(M) to its junction with the M27 Motorway (Junction 13).
A40(M)	From its junction with the A40 trunk road (Westway) to its junction with the A5 Edgware Road.
A56	From its junction with the M66 Motorway to its junction with the M65 Motorway (Junction 8).
A5103	From its junction with the M56 Motorway (Junction 3) to its junction with the M63 Motorway (Junction 9).

Table 3.16.1 All-Purpose Trunk Roads with Retained Litter Clearing Duties

Table 3.16.2 details those sections of road contained within Design Build Finance and Operate (DBFO) contracts for which the Highways Agency has contracted out the sweeping and cleaning of these roads to the DBFO concessionaire.

The Service Provider, under the terms of his contract is responsible for discharging responsibilities arising from the EPA on behalf of the Secretary of State for those roads listed in Table 3,16.2 where they form part of the Network.

Road No.	Description
A1	From a point 350 metres south of its junction with the Great North Road at Alconbury to a point 280 metres north of the Fletton Parkway Interchange.
A1	From a point 520 metres south of the Old Great North Road at Micklefield to a point 1 kilometre north of the A64(T) Leeds Road.
A14	From a point 420 metres south east of its junction with Rusts Lane to its junction with the A1 trunk road.
A19	From its junction with the A168 road at Thirsk to the roundabout at the junction with the A185 county road immediately south of the southern entrance to the Tyne Tunnel.

Road No.	Description
A30	From its junction with the M5 Motorway (Junction 29) to its junction with the A35 trunk road at Honiton.
A35	From its junction with the A30 trunk road at Honiton to the western leg of the roundabout at the junction of A35 and A31 trunk roads north east of Bere Regis.
A50	From the boundary between the City of Stoke on Trent and the Borough of Stafford at the junction with the A521 county road to the junction with the A516 trunk road.
A66	From its junction with the A19 trunk road to a point 265 metres east of the overbridge to Teeside Retail Park in Stockton on Tees Borough Council.
A69	From its junction with the M6 Motorway (Junction 43) to its junction with the A1 trunk road (West Road Interchange).
A168	From a point 350 metres east of the county road overbridge located 650 metres east of the A1(M) bridge over the eastbound carriageway of the A168 trunk road at Dishforth to its junction with A19 trunk road at Thirsk.
A174	From its junction with the A19 trunk road at Parkway Interchange to the junction with the A1053 trunk road.
A417	From its junction with the A419 trunk road to the grade separated junction at Ordnance Survey Grid Reference 388500E, 217600N near M5 (Junction 11a).
A419	From its junction with the M4 Motorway (Junction 15) to its junction with the A417 trunk road.
A1053	From its junction with the A174 trunk road to its junction with the A1085 county road at Grangetown.

Table 3.16.2 All-Purpose Trunk Roads with Retained Litter Clearing Duties contracted to DBFO concessionaires

3.16.2 Inspection Requirements

No detailed inspections will be carried out and reliance must be placed on the regular Safety inspections and Safety Patrols (see Part 3.1) to decide when any special action needs to be taken.

3.17 The Landfill Directive and Liquid Waste**3.17.1 Purpose**

The purpose of this chapter is to update area teams and Service providers on the implications of the Landfill Directive on the disposal of liquid wastes arising from the highway network and offers guidance on best practice disposal and recovery methods.

3.17.2 Background

The Landfill Directive was implemented in 2002 with the aim of reducing the negative impacts of landfill. The main changes to landfill practices included:

- The categorisation of landfill sites as hazardous, non-hazardous or inert.
- The requirement for pre-treatment of all wastes destined for landfill.
- The progressive diversion of biodegradable waste from landfill.
- The complete banning of liquid waste from landfill

The banning of liquid waste from landfill is of primary concern to highway maintenance contractors. Liquid waste is defined in the Landfill Directive Interpretation Note 1 (Environment Agency, July 2002), included at Annex 3.17.1, as:

- “Any waste that near instantaneously flows into an indentation void made in the surface of the waste,
- Any waste (load) containing free draining liquid substance in excess of 250 litres of 10% whichever represents the lesser amount.”

Gully arisings and balancing pond dredgings can therefore both be classed as liquid wastes, and must therefore be de-watered by Service Providers before disposal in landfill.

In April 2004, the Highways Agency issued Area Management Memo 45/04 seeking information from Service Providers to fully understand and quantify the implications of the Landfill Directive on their operations. The responses revealed a variation in disposal procedures.

3.17.3 Best practice for gully waste disposal

Gully waste can either be disposed of at landfill sites or recovered and recycled. At present, most of the gully waste arising on the highway network is sent to landfill following de-watering. The most common de-watering techniques include the use of lagoons, specialised gully vacuum tankers and de-watering bays.

De-watering using gully vacuum tankers is of concern because the excess water which is decanted from the gully waste is currently being discharged back into the gully run. This is not acceptable to the Environment Agency, as once the water has entered the vacuum tanker it becomes a controlled waste and cannot be disposed of without proper treatment. It is recommended that the decanting of gully liquor back into the gully run is no longer used by Service Providers.

If the Service Provider intend to dispose of gully waste at landfill, it must be subject to prior treatment. Any potential treatment must fulfil all of the following three criteria:

1. It must be a physical / chemical / thermal or biological process including sorting.
2. It must change the characteristics of the waste.
3. It must do so in order to:
 - reduce its volume, or
 - reduce its hazardous nature, or
 - facilitate its handling, or
 - enhance its recovery.

There are various techniques already in use by specialist contractors and local authorities to treat and recover gully wastes. These include mechanical separation and recycling, and ecological treatment and composting

3.17.4 Waste Classification

Gully waste

Gully waste typically contains soil, organic detritus, gravel, sand, litter, heavy metals and hydrocarbons. According to the European Waste Catalogue (EWC), gully arisings are classified as street cleaning wastes (entry 20 03 03) and are therefore non-hazardous. However, it is the responsibility of the waste producer to verify this classification. In most cases, the concentrations of heavy metals and hydrocarbons will lead to gully waste being classed as hazardous.

Oil separator wastes

The EWC entry for interceptor wastes is 13 05 03, which are classified as hazardous, regardless of any threshold concentrations. Oily wastes need to be treated using physical, biological or thermal means.

Balancing pond dredgings

Dredgings from balancing ponds have in the past been deposited on the banks of the balancing pond from which they came. However, given that the dredgings are likely to contain relatively high levels of hydrocarbons and heavy metals, this practice is unlikely to be acceptable. The wastes should be tested to determine their characteristics. Dredgings can be treated and either disposed of or recovered using the same processes as for gully wastes.

Accidental spillages

The waste classification of accidental spillages must be determined on a case by case basis. Reference should be made to the appropriate EWC entry to determine whether the spillage is classed as hazardous, non-hazardous or inert.

3.17.5 Further Information

For further information on the disposal of waste in landfill, reference should be made to "Requirements for waste destined for disposal in landfill – a guide for waste producers and managers", Environment Agency.

Appendix 3.17.1 – Landfill Directive Interpretation Note 1

**LANDFILL DIRECTIVE INTERPRETATION NOTE 1 (Version 1.0, July 2002)****Disposal of Liquid Wastes at Hazardous Landfills****Background**

Paragraph 3 of Schedule 4 of the Landfill Regs impose the obligations of regulation 9 directly on sites classified as Hazardous. Regulation 9 requires that the operator of such landfill sites shall not accept any waste in liquid form (including waste waters but excluding sludges). Therefore this ban applies to all liquid wastes whether hazardous or non-hazardous. The regulations do not provide a definition of liquid and therefore we must rely on the definition in the DEFRA 2nd consultation paper on the regulations:-

- Any waste that near instantaneously flows into an indentation void made in the surface of the waste.
- Any waste (load) containing free draining liquid substance in excess of 250 litres or 10% whichever represents the lesser amount.

Disposal of Road Sweeping and Gully Waste (excluding spillages)**Is the waste liquid?**

This is a significant waste stream produced principally from highway maintenance. Such wastes typically have a significant water content that will vary due to the weather during sweeping and the amount of water added during cleansing operations. Therefore the tests should be applied individually to each load if the waste is to be accepted at a Hazardous landfill. Any such waste that appears to be liquid should be properly de-watered prior to acceptance. Wastes which are not hazardous can continue to be accepted at Non-Hazardous landfills for the time being provided that the licence or permit authorises such acceptance.

Is the waste hazardous?

Road Sweeping Waste: These wastes would be listed under category 20 03 03 (street-cleaning residues) of the European Waste List 2000/532/EC as amended provided they originate from **municipal** street cleaning works. It is the Agency's view that such works would include highway maintenance such as manual sweeping, litter collection and the use of highway sweeping machinery on public highways (public in this context should be taken to mean those highways that the public has access to). Wastes under this category are not hazardous.

Gully Waste: In most cases such wastes would also be categorised under 20 03 03 and therefore are also non-hazardous. It is understood that all public highway gully pots in the UK are used solely to separate solids from liquids. Should a gully pot also incorporate a oil/water separator, such as is commonly found on industrial premises, then the most appropriate classification for any of the solid, sludge or liquid removed would be one of the waste entries

3.18 Environmental Implications of Maintenance Operations**3.18.1 Introduction**

The following advice covers all trunk road and motorway maintenance operations.

There are concerns that trunk road and motorway maintenance schemes can cause environmental effects both within and outside the highway boundary. In some cases this may lead to legal proceedings being undertaken against the Highways Agency and its Service Providers, this can be particularly prevalent where certain types of noisy or vibrating plant are used. The Service Provider should refer to Volume 11 of the DMRB for details of environmental assessment.

For future trunk road and motorway maintenance schemes a check of all known information such as network surveys and surveys relating to other nearby projects must be carried out at an early stage to ensure that maintenance works do not:

a). cause a significant detrimental effect to:

- nearby properties and local communities - both visual and noise
- water, air and soil resources including sensitive receptors
- landscape and archaeology including protected areas and areas of local character
- nature conservation and biodiversity including protected species, habitats and sites
- habitats and species listed in the UK, Highways Agency (HABAP) and relevant Local Biodiversity Action Plans

b). contravene relevant legislation, such as the Wildlife and Countryside Act, Habitats Directive, related to the areas in a) above.

In addition to land within the highway boundary affected by the works the check must include areas immediately adjacent to the works but outside of the highway boundary.

3.18.2 Investigation

If there is a likelihood of a scheme having a detrimental effect on the area and/or a potential contravention of relevant legislation, then, a walk over survey of the area involved, by a competent environmental specialist from the Service Provider, must be undertaken at the earliest opportunity. A desktop exercise identifying all of the environmental constraints must be undertaken prior to any walkover exercise. If the walk over survey highlights particular issues advice on avoidance or mitigation of those effects must be sought from Network Services regional environmental advisors.

There is a need to be aware that in certain circumstances (e.g. designated sites and protected species) more detailed surveys may be required. Time and sufficient resources must be allowed:

a). to undertake the surveys

b). for official consultations with the Statutory Consultees (e.g. English Nature/ Environment Agency etc.)

c). for any additional works which may need to be carried out within the project because of these discussions

d). for licences to be sought

3.18.3 Design Considerations

When designing the scheme, design teams must also consider whether any environmental enhancements, such as achieving environmental KPI's and HABAP targets, can be achieved, for instance, better protection of watercourses, increasing the area of land suitable for nature conservation/biodiversity interests, without prejudicing other road related issues such as safety.

The long-term viability of any enhancements must be considered particularly with regard to the amount of management that will be required to deliver the enhancement. Where considerable management is likely to be required the design team must consider financial provision for this prior to delivering the enhancement.

Design teams must ensure that the results of any considerations made using the headings at 3.18.1 a) above are recorded on an appropriate file.

The results must:-

- list the checks made
- list the results of those checks

and list any actions taken especially in terms of compliance with any relevant legislation.

Examples of the implications of this advice are given below:

Environmental specialists checked the effects that bridge strengthening and maintenance would have on the surrounding nature conservation interests before the works went ahead. By doing so this avoided problems with protected species (bats) and rare plants found in the area.

Work on a maintenance project was significantly delayed due to the late discovery of the presence of protected species and habitat. Project and Consultancy teams worked closely with English Nature to review the working methods for the scheme, thus avoiding potential litigation resulting from the effects of the original project. However delay could have been avoided if this issue was identified at an early stage.

Emergency works were required to resolve a flooding issue on a scheme and resulted in the incidental death of several European protected species. A prosecution was almost brought by English Nature however, had the presence of such species been considered prior to the works being undertaken this may have been avoided.

3.19 Health and Safety Management within Depots**3.19.1 General**

The Highways Agency provides a number of depots throughout England, and shares Service Provider's depots in a few cases where this is more convenient for both parties. This chapter details the Highways Agency managerial structure for managing health and safety for depots, and provides health and safety management responsibilities to the Service Provider. It also details the duties and responsibilities of the Highways Agency staff, contractors and those of the Service Provider and their sub-contractors. It further outlines procedures to be followed in all depots.

Whilst the Health and Safety at Work, etc. Act 1974 places general duties and responsibilities on all personnel, the task of co-ordinating health and safety is a critical one. Service providers manage depots and this management responsibility includes the co-ordination of day-to-day health and safety. All employers and their employees who work in, or have responsibility for depots, must co-operate within an agreed managerial framework in order to actively manage health and safety in their working environment.

Service providers providing depots used for Highways Agency works must adopt similar policies, standards and procedures thus encouraging a uniform approach to health and safety.

3.19.2 Service Providers Duties and Responsibilities

The Service Provider is responsible for co-ordinating health and safety within depots and for developing and maintaining compliance with policies, standards and procedures applicable to the depot.

The Service Provider must appoint a named individual, competent in matters relating to health and safety in depots, who must report to the Highways Agency Service Manager responsible for the depots.

This relationship represents the primary management link between the Highways Agency and the Service Provider with respect to management of health and safety in depots.

At each depot, the Service Provider must provide a notice board permanently and prominently affixed to an internal wall near the entrance to the office, dedicated to health and safety matters. It is the responsibility of the Service Provider to ensure that all relevant health and safety information and instructions, including statutory notices are displayed on the notice board and that it is kept up to date.

The Service Provider must prepare and permanently display on the notice board a 1:500 scale plan of that depot managed by them showing the following:
boundary fences;

- access/egress arrangements;
- roadways including traffic and pedestrian routes;
- parking areas for plant, employees and visitors;
- building outlines;
- storage area(s) including the content, where hazardous substances are stored;
- fixed plant and equipment;
- allocation of storage space;
- building maintenance responsibilities;
- fire arrangements;
- other pertinent features.

3.19.3 Access Requirements

Other organisations requiring access to a depot must seek permission from the Highways Agency's Service Manager, in conjunction with the Service Provider, prior to entry.

Contractors must liaise with the Service Provider indicating their programme of works including:-

- access, working hours, signing in and out;
- parking areas;
- use of welfare facilities;
- use of depot equipment.

During normal working hours all visitors to depots staffed must sign in and out using a visitor's book, which is normally kept in the reception area at the depot. All entrances must be signed to indicate these arrangements.

Depots that are not staffed throughout the working day must display at their entrance a contact telephone number to arrange access.

The Service Provider is responsible for co-ordinating and enforcing health and safety standards for their sub-contractors.

Access arrangements must be made for specialist motorway communication and signalling maintenance contractors and Highways Agency staff who have authority to enter into transmission stations located within a depot. Such personnel have the authority only to undertake activities within transmission stations, associated equipment cabinets and their immediate vicinity.

The most direct, safe route to the transmission station must be followed in accordance with the site specific risk assessment. Keys to these transmission station gates are issued by the Traffic Technology Group to authorised personnel only.

3.19.4 Management Procedures

The health and safety management process begins with the Service Provider and the Highways Agency Service Manager completing the Quarterly Review Checklist (QRC) and the Monthly Inspection Checklist (MIC). QRC ensures an understanding of policy documents between the client and Service Provider.

The Service Provider must copy the completed forms QRC and MIC, along with the site specific risk assessments and associated mitigation measures to sub-contractors, and other organisations using the depot. In addition a copy must be sent to the Highways Agency Service Manager marked for the attention of the Winter Maintenance Officer (WMO)/ Assistant Winter Maintenance Officer (AWMO). This will ensure that all organisations using the depots have copies of completed forms (QRC and MIC) and therefore know the policies, standards and procedures applicable within the depots.

Each organisation must sign and date an acceptance note to show that they have received the information. These acceptance notes must be retained by the Service Provider and made available to the Highways Agency on request.

The forms (QRC and MIC) must be updated and issued by the Service Provider as instructed by the Highways Agency to reflect changes in legislation, use and circumstances.

3.19.5 Quarterly Review Checklist (QRC)

The Highways Agency Service Manager will visit each depot at the start of a contract, and then every 3 months to review health and safety with the Service Provider.

This review must be undertaken using the form QRC.

The inaugural review must be undertaken with the Service Provider and other relevant organisations who will use the depot to establish and agree the content of the form QRC. This will provide the Service Provider with the ability to act, liaise and monitor in accordance with the health and safety management requirements of the depot.

At the subsequent quarterly reviews the Highways Agency Service Manager and Service Provider must undertake the following:

- check that the form QRC and MIC are correct and up to date;
- note that actions from monthly safety inspections have been carried out and recorded;
- record remedial actions not yet completed and arrange for action to be taken as necessary;
- monitor expenditure on health and safety;
- agree provision of any new facilities;
- agree modification of existing facilities
- ensure that any changes to legislation, Highways Agency standards and procedures are implemented;
- approve changes in personnel;
- approve training needs arising from the above items;
- Review any new risk assessments and their associated proposed mitigation methods.

At the subsequent quarterly reviews the Highways Agency Service Manager must additionally undertake a review of any relevant monthly (and other) safety reports to confirm, as far as reasonably practicable, that current Highways Agency standards are being met.

The Service Provider must complete and retain form QRC in respect of the quarterly review and distribute copies to:

- the Highways Agency Service Manager;
- The WMO/AWMO.

3.19.6 Monthly Inspection Checklist (MIC)

The Service Provider must conduct a monthly health and safety inspection of the depot and report all conclusions and actions taken to the Highways Agency Service Manager, WMO and AWMO.

This inspection must be undertaken using the form MIC. The initial monthly inspection must be undertaken at the start of a contract.

Monthly reports must be monitored to ensure previously agreed actions have been implemented, health and safety legislation complied with, trends established, problem areas identified.

The MIC must incorporate the need to place timescales for each action and apportion responsibilities for that action.

Application of the monthly inspection and use of its accompanying form does not preclude the need for all staff and operatives to be vigilant and report any unsafe acts or unsafe conditions at the time of observation.

3.19.6.1 Quarterly Review Checklist (QRC)

Quarterly Review Checklist – QRC (page 1)					
Location		Date and time			
Depot		Attendance			
Date of Notes					
Service provider					
Sub contractor					
Notes made by:					
Review No.					
The QRC records that the necessary information/process is in place or identifies action to ensure they are put in place. It also identifies the owner to ensure that the necessary action is progressed to completion. A separate record of the meeting must be made by the Service Provider to record the agreed actions, comments and details required by this form.					
Ref	Subject	Details	Date confirmed	Date for completion	Action Owner
1	Information required by the Service Provider	Highways Agency's Safety Policy;			
		Rules and conditions for contractors			
		Client's rules/procedures (e.g. permits to work);			
		List of external contacts (e.g. Key stakeholders, local authorities, emergency services etc.);			
		Depot Health and Safety File			
2	Information required from the Service Provider:-	Service provider's Safety Policy			
		Names of Service Provider's Safety Advisers/Supervisors			
		Method Statements (Depot operations)			
3	Project meeting	Agree attendance frequency, content etc.			
4	Codes and standards	Agree those relevant to the work within the depots (some may have been listed in the contract documents)			
5	Safety Organisation	Managerial and staff health and safety organisation and representation			
6	Training	All employees must be given any necessary induction/instructions on their arrival at the depot.			
		Any employees required to do special tasks e.g. spreader/snowplough driver must have appropriate training.			
7	Sub-contracting	Agree arrangements to ensure safe methods and systems of work when contractors intend further subcontracting			
8	Accidents / diseases / dangerous occurrences	Agree arrangements for the reporting of all accidents and incidents occurring at the depot.			
		Agree arrangements for the reporting of all RIDDOR reportable accidents and incidents to the relevant enforcing authority.			

Quarterly Review Checklist – QRC
(page 2)

Ref	Subject	Details	Date confirmed	Date for completion	Action Owner
9	Hazardous conditions	Agree arrangements to advise the depot Manager (or their safety supervisor) any hazardous conditions which might expose employees to work in, or have access to such places.			
10	Welfare facilities/first aid /occupational health and hygiene service	State who provides them and note any exceptions.			
		Arrangements for shared facilities to be confirmed by the contractor providing the facilities.			
11	Housekeeping	Arrangements for storage and removal of industrial and domestic waste.			
12	Permits to work (PtW)	Agree areas of work where Permit to Work procedures apply.			
		Ensure affected contractors are fully aware of current PtW and have the necessary competency, instruction and information.			
13	Fire precautions and Emergency Procedures	Ensure Fire Risk Assessment has been completed for all areas of the depot.			
		Arrangements for raising the alarm, rescue and evacuation procedures in event of fire and other emergency, e.g. release of toxic fumes.			
		Ensure Fire Log Book is maintained and identified actions are completed.			
		Agree training, instruction and information to users of the depots.			
14	Access to depot and site security:-	Ensure depot security arrangements are fit for purpose.			
		Agree and ensure safe access for vehicles, including disabled vehicles, and pedestrians with clearly marked traffic routes and parking areas.			
		Agree and ensure mandatory maximum speed limit is set and signed.			
		Agree arrangements for deliveries, loading and unloading.			
		Ensure visitors' booking in and out arrangements are clearly indicated.			
15	Authorised users	Check contact lists (name and phone number) are current.			
16	Other				

3.19.6.2 Monthly Inspection Report (MIC)

Monthly Inspection Checklist - MIC								
Location				Date and Time				
Depot				Attendance				
Service Provider								
Sub-Contractor(s)								
Completed by								
Review No:								
Procedure for Completion of Form 1. MIC details the activity, category and defect descriptions to be used during the health and safety inspection. 2. For items which meet the standard, a tick must be entered in the Confirmation column. 3. Items which fail to meet the standard must be recorded using the respective columns.								
Activity	Defect	Location	Description	No. Items	No. Defects	Date for Completion	Action Owner	Confirmation
Boiler Room(s)								
Bottled Gas Storage								
Electrical Systems & Lighting								
Fencing								
Fire Prevention & Emergency Procedures								
First Aid								
Garage/Workshops								
Generators								
Inside Stores								
Offices								
Outside Stores								
Recycling & Waste								
Salt Storage & Loading								
Wash down Area								
Welfare Facilities								
Other								

3.20 Identification of Workplace Hazards within Depots**3.20.1 General**

This chapter describes health and safety legislation regarding workplace hazards typically encountered in Highways Agency depots and must be considered in conjunction with the use of the forms in 3.20.1 and MIC.

The Service Provider must comply with all relevant statutory provisions applicable to their work in depots.

This may be deemed to cover the general duties under the Health and Safety at Work, etc. Act (HSWA) and the more specific duties in the various Regulations made under the HSWA.

The Management of Health and Safety at Work Regulations (MHSWR) places a duty on employers to identify hazards, make appropriate risk assessments and manage the risks accordingly.

In particular the Service Provider must prepare a comprehensive risk assessment for each depot detailing likely hazards that may be encountered and the control measures required to mitigate the associated risks. These control measures must be disseminated to all relevant staff working in the depot through regularly held recorded toolbox talks or similar. In addition to this, visitors to the depot must also be made aware of potential risks to their health, safety and welfare, and mitigation methods as part of the depot's Health and Safety induction.

This chapter does not in itself constitute a formal risk assessment by any employer of the health and safety of their employees or others in depots. It is intended to encourage a broadly uniform approach on the part of Service Providers to the identification of hazards, the carrying out of risk assessments and the determination of control measures which must be put into operation to comply with duties under current health and safety legislation.

A statutory duty exists on Service Providers as employers to appoint a competent person or persons to assist them in carrying out the requirements imposed on them by the MHSWR and those of specific regulations e.g. the Control of Substances Hazardous to Health Regulations (COSHH), the Manual Handling Operations Regulations, and the Noise at Work Regulations. This is not an exhaustive list and it is the Service Provider's responsibility to ensure that the requirements of all the latest regulations applying to operations within a depot are complied with.

Regulation 9 of the MHSWR identifies particular duties on employers who share a workplace, whether on a temporary or permanent basis, requiring them to co-operate and co-ordinate in the carrying out of their statutory obligations, including the exchange of information and the assessment of shared risks. Depots, by their very nature, can be categorised as shared workplaces. This chapter is intended to ensure that the Highways Agency and Service Provider complies with this statutory obligation through the identification of typical hazards.

Upon identification of a hazard the Service Provider must put in place methods of elimination, substitution, reduction or other suitable control measures, inclusive of any precautions or controls already in place to ensure that all risks are as low as reasonably practicable.

It is the responsibility of the Service Provider to take all reasonable steps to ensure that employees in depots managed by them co-operate, inform and exchange relevant information concerning the risks arising out of, or in connection with, their undertakings. This may entail, amongst other things, an exchange of health and safety policies, risk assessments, method statements and permit to work systems where appropriate.

3.20.2 Depots as Places of Work**3.20.2.1 General**

The Workplace (Health, Safety and Welfare) Regulations set general requirements in the four broad areas of working environment, safety, facilities and housekeeping and are supported by an Approved Code of Practice. The Service Provider must ensure that all depots comply with the Workplace Regulations.

Smoking in any depot is only allowed in areas designated, and clearly marked, by the Service Provider.

Hazards and associated risks identified within the four broad areas of the Workplace Regulations which may be typically found in depots include:-

- slips, trips and falls caused by the accumulation of waste material, debris and obstructions or slippery floors in garages, workshops and pedestrian routes;
- inadequate levels of lighting around machines in the depot yard, near stockpiles, and elsewhere;
- inhalation of toxic gases, fumes and particulates due to inadequate ventilation in garages and workshops;
- hazardous substances;
- falls into unguarded, open inspection pits;
- plant and vehicular movements.

The Service Provider, subcontractors and Highways Agency staff must identify all relevant hazards associated with their undertakings in the workplace. They must carry out an appropriate risk assessment to determine the measures to be taken to manage the risks to be as low as reasonably practicable. The ensuing control measures must incorporate the general requirements for the specific workplace areas and activities described in 3.20.9.2 to 3.20.9.10. The Service Provider must also ensure the co-operation and exchange of risk assessments or similar relevant information prepared by others concerning their undertakings in the workplace as appropriate.

3.20.2.2 Inspection Pits

Before entering an inspection pit a specific risk assessment must be carried out. This must include consideration of the following:-

- check whether it is a confined space;
- hazardous fumes;
- means of access and egress;
- fuels and oils;
- if considered a confined space then a permit to enter system must be employed;
- if hand lamps are used they must be intrinsically safe;
- inspection pits must be regularly cleaned and any spillages immediately treated or cleaned up;
- unguarded areas must be covered or protected by suitable barriers particularly when the pit is not in use.

3.20.2.3 Movement of Vehicles

Risks with movement of vehicles within a depot include collision with other vehicles, pedestrians, buildings, plant and equipment and hazardous substances storage areas.

The maximum speed limit for all depots is 10mph.

All vehicles must be safely driven within the speed limit using designated routes and directions.

Vehicle and pedestrian movements must be segregated with areas clearly marked.

All vehicles, except private vehicles and those restricted to public and staff parking areas, must be reversed using reversing alarms and vehicular fitted reversing lamps with the assistance of trained competent banksmen.

All vehicles and equipment must be safely parked or stored in designated areas and vehicular movement lanes must be kept clear of obstruction.

Protection by suitable barriers is required during prolonged and/or multi-directional reversing work (e.g. salt loading).

3.20.2.4 Vehicle Exhaust Fumes

The release of vehicle exhaust fumes within a workshop or other building may lead to respiratory problems.

Engines must not be run inside workshops and garages unless these areas are adequately ventilated to minimise the build up of toxic exhaust fumes.

3.20.2.5 Lighting

All workplaces must have suitable and sufficient lighting including emergency lighting as appropriate. Lighting to traffic movement lanes, depot yards, salt barns, loading areas and hoppers must be used when natural light is insufficient for safe working.

3.20.2.6 Fire Precautions

The Service Provider must consider work activities in depots managed by them and identify potential hazards that may result in an outbreak of fire. Fire protection and prevention measures must cover all parts of the depot and comply with the requirements of the Fire Precautions Act and other fire regulations to the satisfaction of the local fire authority.

Fire is a chemical reaction between a combustible substance (fuel) and oxygen initiated by a source of ignition. It presents a threat through heat, fumes, smoke, explosion, burning and structural collapse. Fire prevention measures centre upon the removal where possible, or control of available fuel and ignition sources. Sources of fuels in depots include petroleum, diesel, oil, liquefied petroleum gas (LPG), industrial gases, paints, solvents and materials such as paper, timber and rags. Possible ignition sources include sparks emanating from machinery, hand tools and electrical equipment, direct flame from cutting and welding operations, hot surfaces, cigarettes and matches.

In order to reduce the risk of fire, the Service Provider must consider all fire hazards and associated risks in each of the depots managed by them. Included in the ensuing control measures, smoking and naked flames must be prohibited in or near the following:-

- inspection pits and fitters' workshops;
- battery charging rooms or areas where batteries are being charged;
- fuel installations and oil storage areas;
- storage areas for paint, thinners, chemicals, weed killers, etc;
- LPG containers;
- accumulations of combustible materials and other areas where no smoking, no naked lights or highly flammable signs are displayed;
- and any other area where smoking or a naked flame may constitute a danger.

The Service Provider must ensure that combustible waste and debris are controlled by efficient housekeeping and safe disposal. Only minimum supplies of flammable materials must be kept in depots. The use and storage of petroleum, LPG and other highly flammable and/or explosive substances must comply with the requirements of the Petroleum Consolidation Acts and the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations.

3.20.3 Work Equipment

3.20.3.1 General

The Service Provider must reduce the risks to the health, safety and welfare of their employees and others who may be affected by their operations involving work equipment in depots. They must comply with the general duties and specific requirements of the Provision and Use of Work Equipment Regulations (PUWER).

Work equipment is defined as any machine, apparatus, tool or installation used at work. Use is defined as starting, stopping, repairing, modifying, installing, dismantling, programming, setting, transporting, maintaining, servicing and cleaning.

The need for appropriate training, maintenance and suitability assessments applies to all equipment. The Service Provider must further ensure compliance with Regulations for specific work equipment and its use, for example, Lifting Operations and Lifting Equipment Regulations (LOLER).

Equipment must be used in accordance with the manufacturer's recommendations. Appropriate information and training must be provided to all operators of such work equipment.

The Service Provider must comply with their duties under the Workplace Regulations regarding the identification of all hazards associated with work equipment used in depots. The risk assessments must identify control measures to ensure safe systems of work including operating instructions and training. The control measures must include instructions for the specific work equipment identified in 3.20.3.2 to 3.20.9.10. The Service Provider must ensure the co operation and exchange of risk assessments or similar relevant information prepared by other employers concerning their undertakings involving the use of work equipment in depots.

Regulations state that all plant, machinery and equipment must be fit for purpose, properly maintained and safe. When a defect is identified in the operation, suitability or maintenance of such equipment it must be put out of use immediately.

All defective equipment must be marked as defective, or placed in a quarantine area, where there is restricted access.

Guarding of machinery is provided to protect the user from inherent hazards of the work equipment, such as moving parts, yet one of the most common hazards associated with the use of work equipment is the lack of suitable guarding or its deliberate removal.

Other hazards associated with work equipment include traps, impact, contact, entanglement, ejection, electricity, chemicals, temperature, vibration, and noise.

Guarding on work equipment must not be removed or modified by the user. Where guards are missing the work equipment must be put out of use immediately and reported.

3.20.3.2 Lifting Equipment

Hazards include the use of worn or poorly maintained equipment and unsuitable equipment for the task.

All lifting equipment must be adequate and appropriate for the task. Safe permissible working loads must be marked on all lifting equipment and rigorously adhered to. Before any piece of lifting equipment is used the requirements contained in LOLER appropriate to the equipment must be met.

3.20.3.3 Use of Jacks

Only jacks of adequate lifting capacity appropriate to the item to be lifted will be used. Jacks must only be used to raise vehicles to enable adequate supports to be fixed.

Work must only take place under the vehicle when such supports are correctly positioned.

3.20.3.4 Hydraulic Equipment

With any hydraulically raised equipment, work must not commence until the safety bars, frames or pins have been fitted.

3.20.3.5 Steam Cleaning and Pressure Washers

Problems may occur in these operations due to prolonged operator exposure to the sprays, chemical fumes and high pressures which can cause personal injury.

The operator must wear appropriate personal protective equipment as determined by the risk assessment for the activity being carried out.

3.20.3.6 Abrasive Wheels

The following precautions apply to the use of abrasive wheels:-

- abrasive wheels must only be used when effective machine guards to rotating parts are in place;
- the floors and areas surrounding fixed machines must be kept in good condition and free from obstruction;
- splash guards must be used where appropriate to prevent the surrounding areas becoming slippery;
- only trained operators must fit abrasive wheels and operate such machinery;

- appropriate personal protective equipment as determined by the risk assessment for the activity must be worn.

3.20.3.7 Pressure Greasing Equipment

The following precautions apply to the use of pressure greasing equipment:-

- fittings must be secure;
- hoses must be in good order;
- filters must be functioning correctly;
- safety valves must be operating correctly;
- appropriate personal protective equipment as determined by the risk assessment for the activity must be worn.

3.20.3.8 Drills

Appropriate personal protective equipment as determined by the risk assessment for the activity must be worn. Effective guarding of the rotating parts and secure clamping of the work piece must be provided in accordance with the risk assessment.

3.20.3.9 Hand Tools

Hand tools are often overlooked in the maintenance regime for work equipment yet the same regulations apply.

The correct tools for the job must be used, including consideration of the use of low vibratory tools. Tools must be maintained in good condition and stored properly. Any defective tools must not be used.

All tools must be regularly cleaned with moving and adjustable parts lightly oiled to prevent wear and misalignment. Cutting edges must be kept sharp and sharpened in the correct manner to prevent a change in the temper of the metal.

Metal tools conduct electricity and therefore where work is taking place on or near electrical apparatus, insulated tools must be used. Sparks from tools can cause fire or explosion and care must be taken near combustible or flammable materials.

The user must wear appropriate personal protective equipment as determined by the risk assessment for the activity being carried out.

3.20.3.10 Welding and Cutting Operations

Hazards common to gas and electric arc welding and cutting operations include fire, explosion, burns, noise, the production of toxic fumes and metal splatter. Hazards associated with gas welding are the use of inflammable gases and the effects of possible oxygen enrichment, particularly in confined or inadequately ventilated areas.

Electric arc welding hazards can result from poor standards of maintenance, repair and improper use of equipment. There is also a risk to the eyes and skin from the effects of ultraviolet light from the arc.

These hazards must be identified on the depot risk assessment and the risks advised to the staff in the depot through regularly held recorded toolbox talks.

The Service Provider must take all reasonable steps to ensure that every aspect of work involving welding and cutting operations in depots is considered to identify hazards and assess risks. Consideration must be given to the use of hot work permits, in appropriate situations, including work in confined areas and other locations away from workshops. A specific risk assessment must be completed to determine appropriate control measures including segregation from the work, use of barriers, non-reflecting welding screens, working signs and the suitability of personal protective equipment.

Following risk assessments, identified control measures must include the following requirements (not deemed to be exhaustive or necessarily covering all eventualities and hazards) to personnel in depots:

- the undertaking of work involving welding and cutting is restricted to persons trained and
- competent in the use of and familiar with the safety procedures appropriate to the equipment;
- personal protective equipment provided to prevent accident or injury to the body, eyes and head must be worn during any welding and cutting operations;
- protective coatings (paint) must be removed from around areas to be welded to avoid the
- possibility of the emission of toxic gases;
- welding and cutting work on vehicle fuel tanks or any other vessel designed to contain
- flammable or explosive substances are prohibited in depots.

The Service Provider must ensure the co-operation and the exchange of risk assessments, including the mitigation processes, or similar relevant information prepared by employers for all operatives engaged in welding and cutting operations in depots.

3.20.4 Hazardous Substances

The classification of hazardous substances is laid down in the Chemicals (Hazard Information and Packaging) Regulations. The physical form assumed by a hazardous substance or preparation (liquid, gas, dust, fumes or vapour, etc.) is a contributing factor to its potential for harm. Substances included in the Regulations are found in depots including:

- liquid - solvents, petroleum, paints, acid (battery charging), coal tar pitch derivations;
- gas - carbon monoxide (vehicle exhaust), hydrogen (battery charging), Liquid Petroleum Gas (LPG), oxides of nitrogen (welding);
- dust - metal dust (grinding machine), cement, salt;
- fumes - metal fume (welding);
- vapour - solvents.

Working practices must aim to minimise the risks associated with using hazardous substances and the consequences of any accidents. The use, storage, handling and generation of certain hazardous substances must satisfy the requirements of the Control of Substances Hazardous to Health Regulations (COSHH). In addition there are specific regulations providing requirements for the use and storage of a number of hazardous substances (e.g. the Control of Lead at Work Regulations, the Control of Asbestos at Work Regulations, the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations, Dangerous Substances and Explosive Atmospheres Regulations).

The Service Provider and all other employers in depots are under a legal duty to provide safe systems of work for their staff and others who may be affected by their undertakings.

The COSHH regulations require an assessment to be conducted prior to any work involving a hazardous substance. Risk (COSHH) assessments must include the need to ensure that all

hazardous substances are used in accordance with the manufacturer's recommendations and that suitable control measures are implemented. Employers must ensure that sufficient information and training, is provided to users of such hazardous substances and those who are affected by their use.

The Service Provider must ensure the co operation and exchange of relevant instructions including risk assessments prepared by all employers concerning their undertakings involving hazardous substances.

3.20.5 Flammable, Toxic and Corrosive Substances

3.20.5.1 General

Before working with substances personnel must have received relevant training and fully understand manufacturers' instructions regarding correct and safe procedures for the storage, use and disposal of flammable, toxic and corrosive substances.

A detailed risk assessment, that is recorded, must be carried out prior to any work involved with the use or movement of Flammable, Toxic and Corrosive Substances.

The following precautions act as a guide and must be taken as best practice where possible, but are by no means exhaustive and are dependent on the specific nature of the substances involved:-

- only the minimum quantities of such substances must be in use, or stored;
- storage must be in an approved area or container;
- liquids must always be moved in suitable, securely capped cans or drums on which the contents are clearly marked;
- pouring of liquids must be carried out with funnels and there must be no naked flame within 6 metres of the operations or other set distance as instructed by the manufacturer;
- screw tops and stoppers must be replaced immediately;
- drums in use that are fitted with taps must be provided with drip trays;
- drums in use must be stored on end or in cradles;
- drums not in use must be stored on end;
- empty containers must be stored in an approved area;
- consideration must be given to the use of intrinsically safe electrical fittings.

3.20.5.2 Liquefied Petroleum Gas (LPG)

LPG storage and use must comply with the requirements of the Dangerous Substances and Explosive Atmospheres Regulations.

3.20.5.3 Packaging and Labelling of Dangerous Substances

The packaging and labelling of dangerous substances supplied for use and storage in depots must comply with the requirements of the Chemicals (Hazard Information and Packaging for Supply) Regulations (CHIPS). Substances received for delivery must only be accepted with the correct packaging and labelling.

3.20.6 Manual Handling Operations

Injuries are common with manual handling. They can be caused by using incorrect lifting techniques, not taking full consideration of the load to be lifted, or excessive carrying or handling of the load.

Operations involving the manual handling of loads by employees at work which may result in injury must be identified by a general risk assessment as required by the MHSWR. The Manual Handling Operations Regulations in turn require that manual handling must be avoided or reduced as far as is reasonably practicable.

Where it is not reasonably practicable to avoid manual handling operations that may result in injury, the Service Provider and other employers must conduct a specific risk assessment to determine how to manage the risks accordingly. All employees required to undertake manual handling of such loads must be adequately trained and must make use of any other controls, instructions and procedures determined from risk assessments.

3.20.7 Electricity at Work

3.20.7.1 General

The principal risks associated with the use of electricity at work include electric shock, electrical explosions, burns and electrical fires. Electric shocks may result from direct or indirect contact with live conductors and may increase the risk of falls from height (e.g. falls from ladders and scaffolding caused initially by shock currents or explosions). Other risks that may result from the unsafe use of electrical apparatus include slips, trips and falls due to trailing cables.

The Electricity at Work Regulations control the use of electricity in the workplace, by imposing duties on employers and employees. The regulations are supported by Health and Safety Executive's guidance document Memorandum of Guidance on the Electricity at Work Regulations.

The Service Provider must ensure that any duties imposed by them on their employees which involves work on or near to electrical conductors complies with the regulations. All such work must also meet the design, testing and installation requirements of the latest edition of the Institution of Electrical Engineers Regulations for Installations.

3.20.7.2 Low Voltage Installations

These instructions apply to all work carried out on low voltage installations. Where a distribution system is supplied from the supply authority's low voltage mains, these rules must be applicable to all switchgear and apparatus installed after the supply authority's equipment.

Prior to any low voltage installation work the risk assessment must be completed to identify adequate training, the prevention and protection methods to be used (including the need for a Permit to Work system) and the emergency procedures to be adopted.

3.20.7.3 Working on 'Live' Equipment

Only appropriately qualified persons will inspect or work on or near equipment or cables that are electrically live.

Prior to any work on live equipment the risk assessment must be completed to identify adequate training, the prevention and protection methods to be used (including the need for a Permit to Work system) and the emergency procedures to be adopted.

3.20.7.4 Distribution Switchrooms/Server Rooms

Switchrooms must be kept free of all obstructions (e.g. surplus materials or spares) to minimise the possibility of persons falling while carrying out work on or inspecting live equipment. Unattended distribution switchrooms must be kept locked and access must be restricted to competent persons.

3.20.7.5 Circuit Identification

All circuits identified on switches and distribution boards must be clearly and correctly shown.

When circuit re-arrangements or additions are carried out, the identities on switches and distribution boards must be updated. New labels must be prepared in advance and must be fixed in position immediately the circuit re-arrangements or additions are completed. Handwritten or other temporary labels must only be used in exceptional circumstances and then only for a limited period until typed labels are prepared and attached.

When such re-arrangements or additions are made all records must be immediately updated.

3.20.8 Winter Maintenance Equipment and Other Vehicles

3.20.8.1 General

There are hazards associated with work involving winter maintenance equipment and other vehicles, all of which may result in personal injury accidents. Injuries can occur due to hazards associated with:

- direct bodily contact with machines,
- entanglement in machinery
- ejection of salt particles from moving parts of winter maintenance vehicles and equipment,
- slips, trips and falls on slippery or obstructed surfaces.

The Service Provider must take all reasonable steps to ensure that hazards associated with work involving winter maintenance equipment and other vehicles are considered by each employer whose undertakings include such operations. Resulting risk assessments must determine the control measures to be taken in order to comply with relevant statutory provisions. The ensuing control measures must incorporate the requirements for the specific work activities in 3.20.8.2. These requirements are not exhaustive or necessarily cover all work activities involving winter maintenance equipment and other vehicles.

Only appropriately trained and qualified personnel must operate winter maintenance vehicles or equipment.

The Service Provider must ensure the co-operation and exchange of risk assessments or similar relevant information prepared by employers engaged in such work.

3.20.8.2 Snow Plough Blades

Snow plough blades must be kept in designated areas within garages and on the carrier frame provided to allow safe movement and attachment to the vehicle. The area around snow plough blades must be kept clear at all times to allow unhindered and safe access to the blades. Movement and attachment of snow plough blades must only be carried out by appropriately qualified personnel.

3.20.9 Salt Loading Equipment, Storage and Handling**3.20.9.1 General**

Hazards associated with salt in depots include potential instability of salt stockpiles, the hazardous effects of operatives' prolonged exposure to salt, the effects of adverse weather conditions and dangers accompanying the movement and ascent/descent of hoppers by persons at work.

The Service Provider must take reasonable steps to ensure that every aspect of work associated with salt storage, handling and loading is considered by the employees and employer involved in such work. Appropriate risk assessments must determine the measures to be taken to comply with relevant statutory provisions and the ensuing control measures must incorporate the instructions for the specific items and operations identified in 3.20.9.2 and 3.20.9.3. These requirements are not exhaustive or necessarily cover all work activities involving salt storage, handling and loading.

The Service Provider must ensure the cooperation and exchange of relevant information including risk assessments prepared by all employers concerning their undertakings involving salt in depots.

3.20.9.2 Salt Loading Equipment (Hoppers)

Operative must keep clear of moving parts and ensure that all guards, screens and ladder loops are in place and remain closed or locked, as appropriate, during operations. Operatives must keep clear of the underside of hoppers when salt is being loaded or dispersed to avoid injury from falling salt.

The soundness and security of all guards must be checked.

Maintenance operations in hopper bins must only be carried out by competent maintenance contractors using a permit to work system.

Ascents and descents of the hopper during normal operations must be by the ladders or steps provided and movement on the hopper restricted to the staging catwalks within handrails.

Loose items must not be left on the hopper and lightweight items of large area e.g. inspection hatches, must be properly secured.

All personnel movements and activities during exceptionally strong winds and other adverse weather conditions must be assessed and restricted particularly before they ascend hoppers.

3.20.9.3 Salt Storage and Handling

Work in the vicinity of the salt storage area must only be undertaken by persons who are trained in and aware of the hazards and associated risks involved with the handling of salt and its associated stockpiles (particularly where salt is stored in the open).

Salt must, wherever possible, be stored in salt barns. When stored in the open salt piles must be formed into the shape of long rectangles (dimensions to suit the yard being utilised) because large conical piles of salt present unacceptable hazards. The top surface of the salt pile must be convex to ensure that when sheeted there are no valleys formed as seepage of rain through cracks or joins in the sheeting may form crevices in the salt leading to potential collapse of the salt pile.

When storing salt in barns, salt must not be placed above the fill line on the retaining wall and at that level a minimum one metre wide strip perpendicular to the wall must be left to avoid overstocking, pollution and spillage.

As salt is removed from the stockpile a positive slope, not exceeding 60 degrees to the horizontal, must be maintained to avoid risk to staff and vehicles from the collapse of cliff walls of salt.

High winds create further risks to existing control measures in the safe storage of salt. Sheeting, weights and anchorages must be properly secured at all times to mitigate these risks.

Service provider staff must draw any such hazards to the attention of supervisory staff.

3.20.9 Personal Protective Equipment (PPE)

3.20.9.4 General

The Service Provider must comply with their duties under the MHSWR and other relevant legislation regarding the identification of all hazards associated with their work activities in depots. Resulting risk assessments must determine control measures necessary to ensure safe systems of work. A hierarchy of control measures exists involving the elimination, substitution, reduction, isolation or other means of control of the risks. If these procedures fail to offer an adequate degree of control, i.e. are insufficient to reduce risks to as low a level as is reasonably practicable, then as a last resort, personal protective equipment (PPE) must be provided to control the residual risks. Additionally some legislation requires personal protective equipment to be worn irrespective of other control measures in place.

The Service Provider is therefore required to comply with the requirements imposed on them by the Personal Protective Equipment at Work (PPE) Regulations and a systematic approach must be followed ensuring that workers at risk are properly protected. The main elements of this approach must include the selection, introduction and use, maintenance and storage, and a system designed to monitor its effectiveness. Further, where necessary, appropriate information, instruction and training in the use of PPE must be provided before use.

The selection of personal protective equipment (its type and form) must consider, amongst other things, the scale and type of hazard, fumes, dust, noise etc., specific job restrictions, such as work in confined areas, the needs of the user in terms of comfort, ease of movement and use, the cleaning, maintenance and replacement and other specific regulations currently in place, e.g. the Construction (Head Protection) Regulations.

The Service Provider must ensure that all aspects of work in depots requiring the provision of PPE are assessed and that PPE provided is in accordance with the relevant BS EN standard, e.g. BS EN 471 (Retro reflective clothing).

It is normal practice for Service Providers to issue standard personal protective equipment to their own operatives and staff for normal operations and activities undertaken by them.

However, it is necessary for the Service Provider to ensure that where activities and operations are taking place that necessitate non-standard or additional personal protective equipment, this is available and provided to all staff and operatives, even if they are not their own employees.

It is necessary to ensure that the provision of personal protective equipment is not compromised by the use of other personal protective equipment or the person's own characteristics, e.g. the need for glasses, beards, etc.

3.20.9.5 Safety Helmets

Wherever there exists a risk of head injury, safety helmets must be worn in accordance with the requirements of the Construction (Head Protection) Regulations. Typical situations include areas

where structural maintenance or new construction is being carried out and where activities involve work below winter maintenance vehicles and salt loading hoppers and these must be clearly defined and signed and their locations clearly identified to all operatives and personnel using the depot.

3.20.9.6 High Visibility Garments

Class 3 retroreflective fluorescent jackets with full length sleeves must be worn in all areas within the depot.

Exceptions will only apply in areas designated by the depot manager.

3.20.9.7 Hearing Protection

Typical work activities in depots where noise levels may present a risk include the use of machinery, plant, welding and cutting operations, particularly in confined spaces

Hearing protection must be provided and worn as required by the Noise at Work Regulations.

In all work activities where noise levels present a risk of occupational hearing loss, the principle must always be to reduce the noise at source to at least an acceptable level and preferably to the lowest level possible below the current action levels required by the Noise at Work Regulations.

The wearing of hearing protection must always be regarded as a last resort control measure.

Ear defenders must always be worn in the cabs of snow blowers.

3.20.9.8 Welding and Cutting Operations

Operators and others affected by welding and cutting operations must wear the PPE determined by the risk assessment. Typically, this will include face shields, welding helmets, gauntlets and aprons to protect against burns, metal splatter and the effects of ultraviolet radiation and the use of hearing protection particularly in confined spaces.

3.20.10.6 Work on Hoppers

The risk assessment for work on hoppers may identify the requirement for the use of PPE. This is likely to include a safety helmet with a chin strap, hearing and eye protection, gloves and protective clothing and in particular a safety harness to protect against falls from height noise, hazardous substances and falling objects.

Annex 3.5.1 The Management of Sub-Standard Highway Structures, Concrete Half Deck and Hinge Deck Structures – Background Information

Background

The recent failures of major highway structures in Canada, the USA and elsewhere in the world have been widely publicised and whilst various contributing factors are apparent, common issues are emerging. Amongst these are management of safety critical and vulnerable features of structures, quality of inspections and record keeping, and there are lessons to be learnt that are applicable to UK highway structures, and the Highways Agency assets.

The Commission of Enquiry into the collapse of the de la Concorde overpass in Montreal which had concrete deck half joints, reported that, whilst there were a number of contributing factors, *“the overpass collapsed as a result of shear failure of the south-east cantilever...”* *“The collapse was due to the development and growth of a crack in a zone of weakness located under the upper rebars starting from the beam seat area (Half joints). Over the years, the freeze-thaw cycles along with de-icing salts, caused the concrete to deteriorate in this area. This deterioration caused a cracking plane to spread inside the thick slab.”*

The Commission of Enquiry went on to report:

“For the entire period of time for which the Ministère des Transports du Québec (MTQ) was responsible for the overpass the structure was never subjected to an inspection and maintenance programme that took account of its particular characteristics, notably, the critical beam seats at the ends of the cantilevers” (Half joints)

“The commission is of the opinion that the vulnerabilities of the de la Concorde overpass, a unique structure that was difficult to inspect, were not taken into account adequately by the MTQ. The MTQ did not rigorously and effectively deploy all the means at its disposal to properly evaluate the condition of the overpass despite numerous signs of deterioration. It also failed to maintain adequate records ...”

“The commission finds that the overpass inspections were at time deficient, lacking adequate quantification of the deterioration, sometimes incomplete because not enough time was devoted to the inspections and not thorough because the inspectors failed to look for the reasons behind the deterioration.”

The Commission made a number of recommendations regarding targeted inspections and diagnosis and the implementation of *“an accelerated, comprehensive and easily accessible on-line system containing all records and data relevant to the structure, including reports on inspections and repair activities.”*

Although the Highways Agency already has requirements [including the DMRB standards, CHE memoranda, IAN and systems (e.g. SMIS) supporting the above recommendations it is concerned that they are not always being followed. For this reason, requirements are mandated at 3.5.4.4.

PART 2 – ASSET MANAGEMENT RECORDS

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2.1 Introduction to Network Management Information

The Highways Agency is responsible for the operation and maintenance of an Approved Network. The Approved Network includes the great majority of motorways and all-purpose trunk roads in England. The Approved Network is not static. Roads may be detrunked and passed to Local Authorities; they may occasionally be reclassified as trunk roads and added to the Highways Agency's portfolio; new roads may be built and added to the Network.

The Highways Agency maintains the Highways Agency Pavement Management System (HAPMS), a computer-based model of the Approved Network and its history. The model provides the sole definition of the Approved Network. The process of defining the Approved Network to a high quality has involved a considerable amount of effort on the part of the Highways Agency and its Service Providers. All parties must therefore regard the Approved Network as a valuable asset that must be maintained.

The Approved Network as defined in HAPMS must be used as the definitive location reference for:

any technical and condition surveys of the pavement asset, e.g. Routine Maintenance Management System (RMMS), visual surveys (of both flexible and concrete surfaced pavements), Deflectograph, Sideways Force Coefficient Routine Investigation machine (SCRIM) and TRAFFIC-speed Condition Surveys (TRACS).

In addition to the Network definition and condition data, HAPMS contains data that describes the physical characteristics of the Network and its makeup.

2.2 Highways Agency Pavement Management System

2.2.1 General

The management system for the carriageway pavements of the motorway and all-purpose trunk road network, Highways Agency Pavement Management System (HAPMS), was developed and continues to be enhanced to meet the ministerial targets identified in the Highways Agency's 10 Year Plan.

HAPMS consists of a set of computer applications that provide the following business capabilities:

- Improved data management by holding **network, construction**, definitive **inventory, traffic, accident** (described in Chapter 2.6.8) and **condition** data on a single database (the Network Data Repository)
- Enhanced analysis and reporting of the data both in map-based and textual formats
- Integrated tools for the optimisation, in terms of minimising whole life cost within the available budget, of pavement maintenance at both a scheme and network level
- Recording and management of lane closure information

The HAPMS applications that are currently available to Service Providers are:

- Confirm (proprietary MapInfo software)
- Machine Survey Pre-processor (MSP)
- Visual Surveys (described in Chapters 2.9 and 2.10)
- Scheduled Road works (SRW) (described in Part 6 Chapter 6.2)
- Forward Facing Video footage (Chapter 2.6.5)
- SWEEP.S (described in HAPMS documents 348, 460 & 461).

HAPMS is concerned only with operational data.

Figure 2.2.1 shows the relationship between the currently available HAPMS components, including applications and data.

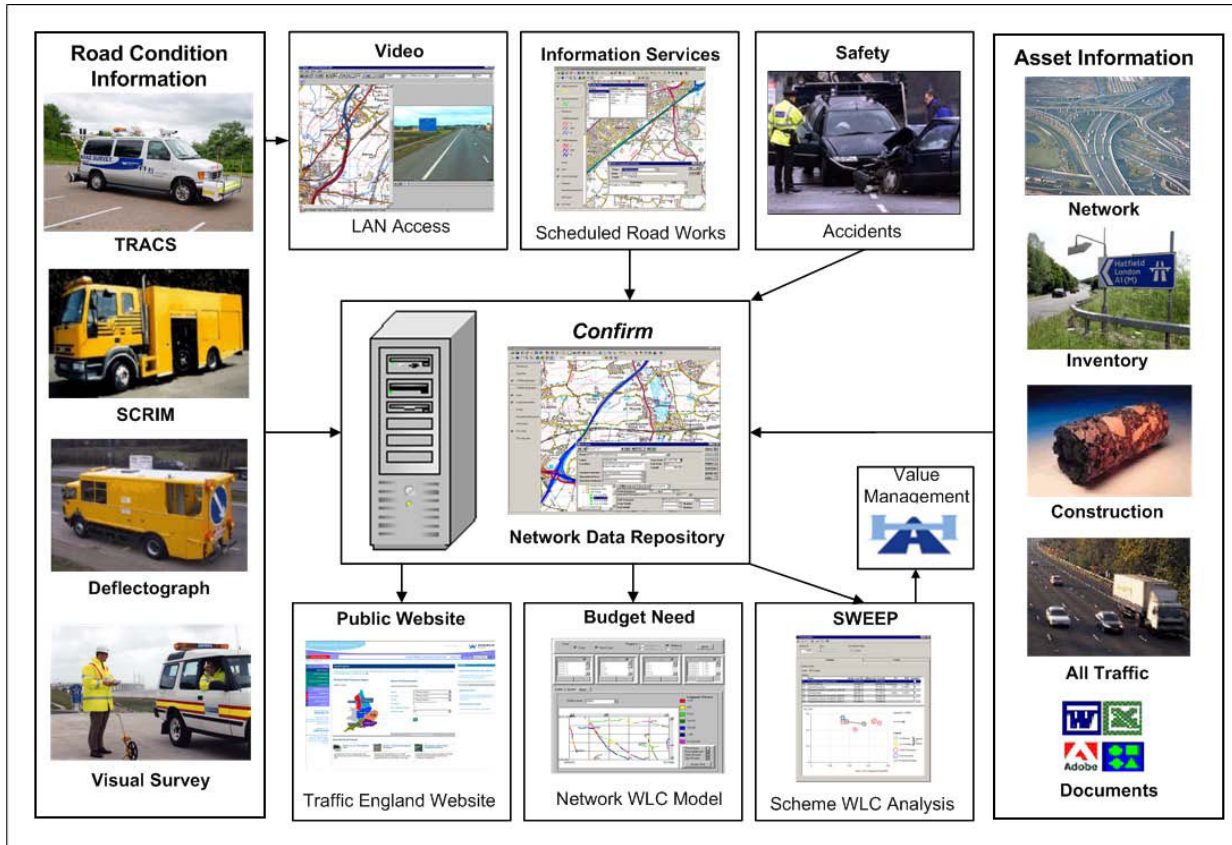


Figure 2.2.1 HAPMS Principal Components

2.2.2 Accessing HAPMS

The Service Provider must access HAPMS via their Highways Agency extranet or ISDN connections. For information about using the Highways Agency connection, the Service Provider must, in the first instance, contact their own internal IT departments. Any requests for help in using HAPMS, including requests for training of new users, must be directed to the HAPMS Support Team (HAST) via the Highways Agency ServiceDirect helpdesk in Leeds (Telephone: 0113-2541140; E-mail: ServiceDirect@highways.gsi.gov.uk).

The central component in the HAPMS suite of software is the Network Data Repository (NDR), this has been built around MapInfo's Confirm software. Confirm is a market based software suite for the management of pavements that has been modified and enhanced to meet the business needs of the Highways Agency. It is licensed to the Highways Agency for use on Highways Agency roads only and must not be used on any other road or for any purpose not described herein.

One of the guiding principles of the development of HAPMS is that there must be only one version of each item of these data, held centrally, and maintained by the Service Provider. The central database, or Network Data Repository (NDR), is shown in Figure 2.6.1. Confirm is the tool by which the data are managed, analysed and reported.

2.2.3 The Importance of Up-to-Date Data

HAPMS is an online system from which national, regional and area reports are extracted. It is essential therefore that all data are kept up to date, for example construction data relating to where and when quieter surfacings have been used, in order that the Highways Agency can report on its 10 Year Plan target.

The Service Provider is responsible for the accuracy of the content held within HAPMS for their Network.

2.2.4 DBFO SON-NET Submissions

Pre-2003 DBFOs must continue to use SON-NET and send amended SON-NETs to the HAST via e-mail (hapms@highways.gsi.gov.uk).

SON-NETs take the form of macro enabled Microsoft Excel spreadsheets. Those using SON-NETs must contact the HAPMS Team via ServiceDirect to obtain the latest version

2.3 Introduction to Section Referencing

Section Referencing provides a consistent and robust location referencing system, enabling the accurate and reliable allocation of data to the motorway and all-purpose trunk road network for which the Highways Agency is responsible. The use of section referencing has resulted in the derivation of a nationally consistent, high quality **Approved Network**, a process which has involved a considerable amount of effort on the part of the Highways Agency and Service Providers. Section referencing is maintained by the Service Provider using HAPMS.

The Service Provider must designate a member of his staff, the "Network Referencing Manager" (NRM). This individual will be responsible for the accuracy, completeness and timeliness of the Approved Network in their Area and for liaison with the Highways Agency on matters relating to section referencing, and must attend the NRM training course run by the HAPMS team. The Highways Agency Pavement Management System Support Team (HAST) maintains a schedule of nominated NRMs and of their deputies. The Service Provider must ensure that any change of NRM is notified to the Service Manager and to the HAST, and that the new NRM is fully appraised of the Approved Network maintenance procedures.

Pre-2003 DBFO Concessionaires who do not currently have access to HAPMS must use SON-NETs (Microsoft Excel workbooks) to advise the HAST of any changes to the Approved Network.

The HAST (in its role as Network Auditor) will undertake regular audits of the Approved Network to ensure adherence to the principles of section referencing. The Highways Agency reserves the right to instruct the Service Provider to make changes to the Approved Network.

The Highways Agency cannot undertake to meet any special requirements of external referencing systems. If Service Providers intend to incorporate details of the Approved Network into their own local systems, then their systems must be developed so that they support the Highways Agency's section referencing method

2.3.1 Section Referencing Principles

Section referencing divides the Network into sections, each having fixed start and end positions and road alignment. Each section also has certain constant characteristics along its length, for example, the number of permanent lanes and environment (rural/urban).

Sections must be terminated at the following locations:

- Major road junction
- End of slip road taper (sections on both the slip road and main carriageway must terminate)
- Change from one-way to two-way traffic or vice versa
- Change in the number of permanent lanes (short lengths of additional or reduced lanes at or around junctions may be ignored)
- Rural/urban boundary
- Service provider boundary (including the boundaries of secondary Service Providers – see Chapter 2.4.8)
- Change of road number (including, for example, a change from A1 to A1M)
- End of trunk road, e.g. the road becomes a local road

In addition, care should be taken to select practical section lengths because accuracy is essential to all aspects of section referencing. When selecting sections, account should also be taken of the recommendations on network referencing contained in the RMMS Survey Procedures Manual.

Note that:

- Each side of a dual carriageway must be referenced separately.
- Lay-bys separated from the main carriageway (known as ox-bow lay-bys) are sections in their own right. It is not necessary to split sections on the main carriageway to form a junction between the main carriageway and the lay-by.
- Roundabouts are referenced as separate sections.

2.3.2 Agent Authority Area Codes

Agent Authority (AA) Area Codes are used for the referencing of sections. In most cases AA area codes correspond to Local Authority areas (Counties and Metropolitan Authorities) and must be used for the referencing of sections wholly or primarily within those areas. However each Service Provider is also assigned its own AA area code which may be used, but only with the approval of the Network Auditor. A list of the current Local Authority AA Area Codes is given in Annex 2.3.1 of this document.

2.3.3 Section labels

Each section is assigned a section label formulated as follows:

- A four-digit AA area code (see Annex 2.3.1), followed by
- An “A” or “M” character depending on the section’s road class, followed by
- The road number of up to four digits, followed by
- An optional “M” character (depending on the road class), followed by
- A forward slash (“/”), followed by
- A section number of up to three digits

The following are all examples of syntactically valid section labels:

1900M1/3
 1900M62/105
 1900A1M/25
 1900A1001M/123
 1900A10/15
 4720A6120/103

Each section label is individual to that section, irrespective of surrounding sections. There is no requirement to maintain sequential labelling of sections along a road.

2.3.4 Section start and end dates

Each section has a start date, i.e. the date on which it is considered to have become part of the Approved Network.

Initially each section will not have an end date – it will be known as a “Live” section. An end-date will be defined when the section is no longer considered to be part of the Approved Network. This will be either because the length of road no longer exists, has been de-trunked or has been re-referenced.

2.3.5 Nodes and Location Reference Points (LRPs)

Within HAPMS Location Reference Points (LRPs) can be recorded against sections. Nodes are no longer used within the Approved Network..

2.3.5.1 Location Reference Points

A Location Reference Point (LRP) is a known point somewhere on a section. LRPs may be classified as either:

- **An embedded LRP** where there is something physically marking the point, typically a pair of studs, or **Section Reference Marker** (see also section 2.3.7), in the centre of a lane.
- **A geographic LRP** where there is nothing physically marking the point.

Each LRP is given a label, a chainage, a cross-section position (XSP), a position within the XSP, between 0.0 (left hand side) and 1.0 (right hand side), and, optionally, a pair of coordinates. Note that a geographic LRP must have a pair of coordinates.

As a minimum, a LRP must be defined by the Service Provider for the start and for the end of each section, each with a pair of coordinates to a resolution of 1m. The recorded coordinate for the LRP at the start or end of the section may be taken at any point on the cross-sectional line passing through the LRP within the extent of the carriageway, and be within 0.25m of that cross-sectional line. In all other cases the coordinate of an LRP must have a resolution and an accuracy of 1m.

2.3.5.2 Use of Nodes and LRPs within HAPMS

Currently the only direct use of nodes and LRPs within HAPMS are as sources of reference labels for the start and end of survey lanes within planned survey routes. When a planned survey route is created, for each survey lane HAPMS will search for a LRP or node in the following sequence:

- A LRP at the start of the survey lane in the survey lane XSP,
- A LRP at the start of the survey lane in another XSP,
- A LRP at the end of the preceding survey lane in its XSP,
- A LRP at the end of the preceding survey lane in another XSP,

2.3.6 Geographic Representation

Two geographic representations of each section are held within HAPMS. These are known as the 1:50,000 and 1:2,500 idealisations. The Service Provider must maintain the 1:50,000 Idealisation as a good representation of the Network.

The 1:2,500 idealisation is the responsibility of the HAST. It is sourced from the GPS stream of a TRACS survey. Any inaccuracies must be reported through ServiceDirect Team.

2.3.7 Section Reference Markers

Section start and end points are referenced on the ground by one or more pairs of cored thermoplastic markers positioned in the left-hand lane of dual carriageways or one-way single carriageways and on both sides of two-way single carriageways (see Annex 2.5.1). The markers are 100mm in diameter and placed 175mm apart. They have a depth of between 10mm and 20mm,

and the top surface is level with the road surface. The material is a plastic resin with white filler that contains reflective glass particles. It conforms to British Standard (BS) 3262 (1989).

The section reference markers referred to in this section are patented. The Highways Agency has authority to install them as section reference markers on its carriageways. They cannot be used for any other purpose (e.g. delineating zebra or pelican crossings) or on any other roads without the patent being infringed. The patent number is GB2179385B and is administered by East Midlands Diamond Drilling Ltd., a member of the Vickers Highbank Group Ltd., Churchfield House, 1 Lockwood Close, Top Valley, Nottingham (0115 967 9000).

The section reference markers form the first order of surveying reference for all maintenance assessment surveys. They must be positioned with a longitudinal tolerance of $\pm 0.25\text{m}$. The centres of the 100mm diameter holes used to form the section reference markers must be 175mm $\pm 5\text{mm}$ apart

2.4 Section Referencing Procedures

2.4.1 Introduction

Section referencing is primarily a desk exercise, but should be supported by site visits if necessary.

Changes to section referencing by the Service Provider is undertaken using HAPMS.

Pre-2003 DBFO Concessionaires who currently do not have access to HAPMS must use a revised version of SON-NETs (Microsoft Excel workbooks) to advise the Highways Agency of any changes to the Approved Network. Revised SON-NETs from DBFO Concessionaires must be submitted to the HAST via e-mail (hapms@highways.gsi.gov.uk).

2.4.2 Section Length Changes – Re-referencing / Re-calibrating a Section

Before changing a section's length, the Service Provider must measure the distance between the start and end section reference markers using a calibrated measuring device, capable of measuring to an accuracy of $\pm 1\text{m}$. If the section reference markers are not in place, these must be re-instated before the length is measured.

If a section length is found to be wrong, adjacent sections must be investigated to ensure that the overall Network length is consistent with identifiable physical features, for example, roundabouts.

Re-calibrating a section causes associated condition data to be stretched (or shrunk) in length. Sections should only be re-calibrated when correcting a section length that was found to be wrong.

If a section's measured length is more than 10% (for sections shorter than or equal to 500m in length) or 50m (for sections over 500m) of the current HAPMS length, and other data is located on that section (for example, condition data) the section must be re-referenced not re-calibrated.

Re-referencing means end-dating an old section and creating a new one – it should happen only when sections change or are outside the recalibration tolerance. The new section created should be populated with any condition and wheeltrack information from the original section - copied and assigned to the relevant lanes - ensuring that survey data remains assigned to the correct real-world location.

A section must be re-referenced under the following circumstances:

- The start and/or end point of the section has moved (for example, the location of speed limits has moved). This may also result in a length change;
- A change in section function or direction, or;
- A change in the number of permanent lanes, environment or one-way or two-way status.
- Re-calibration is not possible because the recalibration tolerances are exceeded.

2.4.3 Changes associated with schemes

The Service Provider must carry out the section referencing resulting from improvement schemes.

It is the responsibility of the consultant/designer to provide a set of drawings to the relevant Service Provider that show the Network for the area affected by the scheme when opened. To carry out this operation, the designer will need to liaise, through the Highways Agency's Scheme Project Sponsor, with the Network Referencing Manager (NRM), who is responsible for the section referencing, including creating any new sections within HAPMS.

Once a line of communication has been established between the consultant/designer and the Service Provider, any revisions to the scheme layout should be communicated directly to the Service Provider (Figure 2.4.1). Liaison with the PS and the Service Manager will then be the responsibility of the Service Provider.

The Service Provider must consider the effect of the scheme on existing sections, i.e. consider which sections need to be modified, retired or replaced. Existing sections must be retained where the road alignment and other characteristics (as described in Chapter 2.3.1) remain intact, e.g. where the section is only reconstructed and its alignment remains unchanged. Otherwise sections must be retired or created as appropriate.

The Service Provider is responsible for maintaining the 1:50,000 Idealisation of sections within HAPMS.

Plans should be submitted to:

HAPMS Support Team
Highways Agency
29th Floor
Euston Tower
286 Euston Rd
LONDON NW1 3AT

The installation/reinstallation of section reference markers and the removal of any redundant markers must be undertaken as part of the improvement scheme contract to ensure the correct section reference markers are in place before the new or improved road opens.

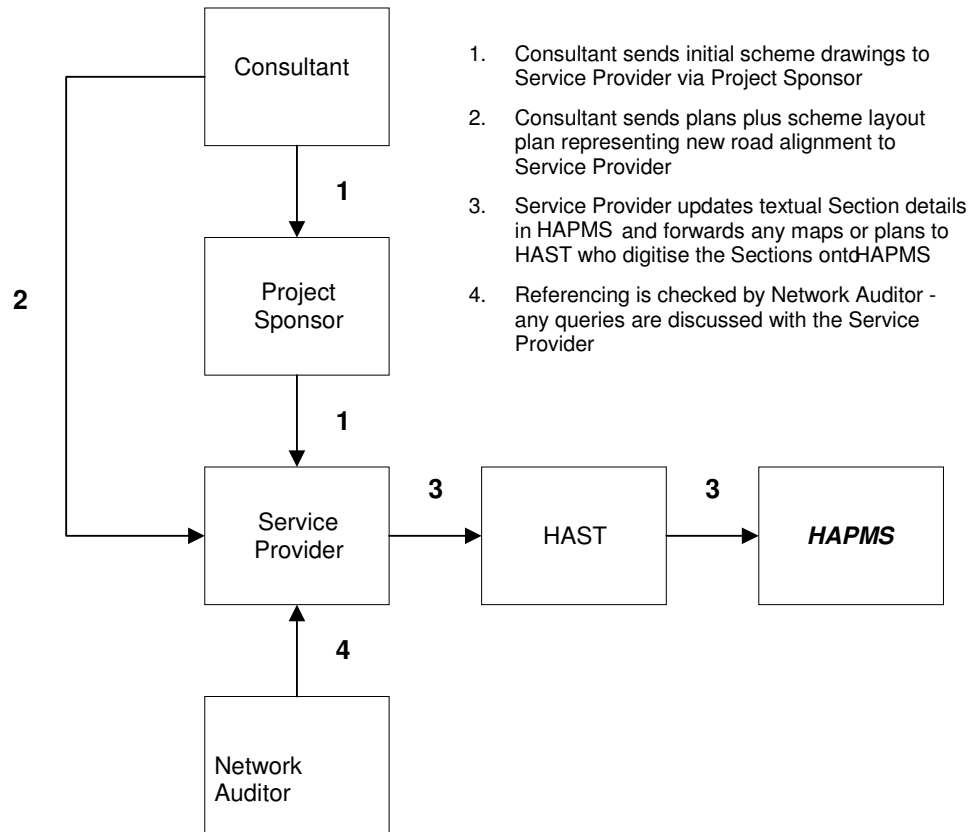


Figure 2.4.1 Network Reference Data Flow Diagram

2.4.4 Timescales for Scheme Related Changes

The Service Provider must ensure that the data described in Chapter 2.4.3 and Annex 2.4.1 are complete and accurate within the HAPMS database by the date the relevant section of carriageway is adopted/trunked by the Highways Agency.

2.4.5 Changes not associated with schemes

For changes that the Service Provider considers necessary and which are not associated with any scheme, the Service Provider must amend the Approved Network within HAPMS as appropriate. If these include changes to the extent of the section(s), the installation of new section reference markers and the removal of any redundant markers must be carried out to match the new section referencing.

Where there is a change of Service Provider, the original sections will be reassigned by the Network Auditor

2.4.6 Trunking of existing Local Authority roads

Where they do not already exist, section reference markers must be installed to match the section referencing. The Service Provider must ensure that the data described in Chapter 2.4.3 and Annex 2.4.1 are complete and accurate within the HAPMS database by the date the relevant section of carriageway is adopted/trunked by the Highways Agency.

2.4.7 Changes instigated by the Highways Agency

Exceptionally, the Highways Agency may deem it necessary to modify the section referencing. The Highways Agency will contact the relevant NRM to discuss the changes required.

The Highways Agency reserves the right to make changes to section referencing.

2.4.8 Sections Shared by Service Providers

Where shared maintenance sections exist, the Service Provider responsible for the maintenance of the pavement (the “primary” Service Provider) is responsible for specifying the section referencing. A single section definition will then be maintained and the “secondary” Service Provider must record any survey information using the primary Service Provider’s section label.

Sections must terminate at the ends of the length of road for which a secondary Service Provider is responsible (see also Chapter 2.3.1). Thus a section must be wholly allocated to a single primary Service Provider or shared by a primary Service Provider and a secondary Service Provider in the same manner over its complete extent.

2.4.9 Changes to the Approved Network within HAPMS

If any of the characteristics of a section are altered, the section must be retired and one or more sections created. This is done by giving the original section an appropriate end date and creating the new section(s), with the updated characteristics, giving it/them a start date that is one day after the end date of the now retired section. (See also Chapter 2.3.4).

Where a section becomes no longer a part of the Approved Network, such as when it is detrunked or demolished, it must be retired by giving it an appropriate end date.

2.4.10 Accuracy and Completeness of the Network

The Service Provider is responsible for the accuracy and completeness of the Network Referencing, in fulfilling this requirement the Service Provider must address any deficiencies within their Network that are brought to their attention within 20 days of notification.

2.4.11 Re-use of Section labels

Section labels of retired sections may be re-used. However, on any given day, the section label must be unique within the Approved Network.

2.4.12 Creation and Retirement Data

When any section is created or retired, the reason (and certain other data) must be entered into HAPMS. Further information on the data required by the Highways Agency’s asset accounting system is given in Annex 2.4.1.

2.4.13 Section Nodes at Service Provider Boundaries

As stated in Chapter 2.3.1, sections must terminate at a Service Provider boundary. A common section LRP will therefore be located at the boundary between Service Providers. Both Service Providers must use a common LRP number at this point. This number must therefore be unique within both Service Providers' Areas.

When changes are made to LRP located at boundaries, the Service Provider's must retain evidence of agreement between both parties as to the new position and number.

One Service Provider is responsible for the placement of the section Reference Marker(s) for this LRP, and this responsibility must be recorded by that Service Provider (see Chapter 2.4.15).

2.4.14 Installation of Section Node Reference Markers

Section reference markers, as described in Chapter 2.3.7, must be installed midway between the wheel tracks of the appropriate lane. If the wheel tracks are not clearly defined by wear or colour then the section reference markers should be installed following observation of passing traffic. The section reference markers must be installed in accordance with Annex 2.4.2.

Examples of typical layouts for section reference markers are shown in Annex 2.5.1.

Section reference markers must be installed clear of all carriageway markings, e.g. "Give Way" lines, lane arrows and junction markings.

Metal studs previously used as section reference markers must be replaced by cored thermoplastic section reference markers and the road surface made good, where necessary, when lane closures are in use for other reasons (e.g. maintenance works).

2.4.15 Recording of Section Reference Markers

In order to enable the accurate replacement of lost or damaged section reference markers, the Service Provider must keep records of their locations. Service Providers must record this information within HAPMS as LRP's.. The Service Provider are then responsible for the completeness, accuracy and timeliness of that LRP data.

2.4.16 Timescale to respond to Network Auditor

In all cases, the Service Provider must respond within 20 working days to requests from the Network Auditor for information to ensure that the section referencing is up to date and for data relating to the Network.

Where the referencing is deemed to be inaccurate by the Network Auditor the Service Provider is required to rectify any errors they have been notified of within 20 days.

2.5 Cross Section Positions

2.5.1 Definition of Cross Section Positions

Each reference section represents a strip of road including both the carriageway and off-carriageway features (e.g. footways and verges) up to the highway boundary. The section therefore may be considered to consist of a number of longitudinal strips that correspond to features such as lanes, and lines that indicate the edge of the carriageway etc. These longitudinal strips and lines are referred to as Cross Section Positions (XSPs). It should be noted that each strip does not have to have a constant width.

The XSPs that may be used within HAPMS are shown in Table 2.5.1 with the numbering and position of the XSPs across the highway:

Name of XSP	Abbreviation	Strip Line or	Numbering Convention
Left Boundary	LB	Line	
Left Boundary Area	LA	Strip	
Left Off Carriageway	L	Strip	1 to 9, right to left
Left Edge	LE	Line	
Left Hard Shoulder	LH	Strip	
Left Additional Nearside Lane	-L	Strip	1 to 9, right to left
Left Permanent Lane	CL	Strip	1 to 9, left to right
Left Additional Offside Lane	+L	Strip	1 to 9, left to right
Centre Line	CC	Line	
Right Additional Offside Lane	+R	Strip	1 to 9, right to left
Right Permanent Lane	CR	Strip	1 to 9, right to left
Right Additional Nearside Lane	-R	Strip	1 to 9, left to right
Right Hard Shoulder	RH	Strip	
Right Edge	RE	Line	
Right Off Carriageway	R	Strip	1 to 9, left to right
Right Boundary Area	RA	Strip	
Right Boundary	RB	Line	

Table 2.5.1 – Cross Section Positions that may be used within HAPMS

The implied direction of the section in Figure 2.5.1, is 'left to right across the page'. The shaded XSPs correspond to longitudinal lines, the unshaded XSPs to longitudinal strips.

Left Boundary	
Left Boundary Area	
	N
	↑
	2
Left Off Carriageway	1
Left Edge	
Left Hard Shoulder	
	N
	↑
	2
Left Additional Nearside Lane	1
Left Permanent Lane	1
	2
	↓
	N
Left Additional Offside Lane	1
	2
	↓
	N
Centre Line	
	N
	↑
	2
Right Additional Offside Lane	1
	N
	↑
	2
Right Permanent Lane	1
Right Additional Nearside Lane	1
	2
	↓
	N
Right Hard Shoulder	
Right Edge	
Right Off Carriageway	1
	2
	↓
	N
Right Boundary Area	
Right Boundary	

Figure 2.5.1 XSP Convention

It should be noted that the XSP conventions assume that the two sides of a dual carriageway are modelled independently. Thus, any details relating to the central reservation must be modelled by Right Off Carriageway XSPs. Also, as shown in the Table, some XSPs may have an 'index' in the range 1 to 9.

Examples of typical use of on-carriageway XSPs are shown in the diagrams in Annex 2.5.1.

2.6 HAPMS Data

2.6.1 Carriageway Construction

HAPMS contains the record of pavement construction for the Approved Network. The pavement record is stored against each XSP and is to be updated from as-built records following all new construction / maintenance actions.

2.6.2 SCRIM Investigation Levels (IL)

The SCRIM investigation levels are set in accordance with HA policy as defined in HD 28/04.

2.6.3 Speed Limits

The legal speed limit is stored against each section or parts therein, where speed limits differ over the length of the section.

2.6.4 Carriageway Inventory

The carriageway inventory provides the definitive record of non-pavement carriageway assets. The Routine Maintenance Management System (RMMS) Manual sets out the list of items that the Highways Agency requires to be stored in HAPMS.

The Highways Agency has discontinued the requirement for the carriageway surface and lane widths to be stored as inventory items, these are now held separately in the XSP and construction records.

2.6.5 Forward Facing Video

A forward facing video had been produced from the TRACS surveys. Images of the road network at 5m intervals are accessed through viewing software that links the images to their position on a map. The video is available to Highways Agency staff via their desktop pc's and Service Providers have been issued with the system on external data drives.

2.6.6 Machine Survey Pre-processor (MSP)

MSP is a stand-alone software application for the validation, route-fitting and pre-processing of data collected during machine pavement condition surveys. It is described in more detail in Chapter 2.11. Unlike Confirm, MSP is owned by the Highways Agency and the Service Provider does not need a license to use it on the trunk road network only.

2.6.7 Scheduled Road works

Scheduled Road works (SRW) is a HAPMS module for the recording of lane closures on the Network. It is described in more detail in Part 6 Chapter 6.2 of this document. As a module of HAPMS, SRW is subject to the same license obligations and is only available for use on the trunk road network.

2.6.8 Accident Data

The Highways Agency is committed to improving safety on its network and to contribute to achieving the Department for Transport's casualty reduction targets. Under the Highways Agency's Safety Strategy, the 'Operational Folder - Operational Guide to the Safety Strategic Plan' sets out guidance for managing safety, provides injury accident data at both national and local levels, and offers information and advice on data analysis. This advice includes suggestions for extending

traditional problem identification, analysis and prioritisation techniques and reflecting changes in accident patterns across the Network.

With the inclusion of accident data within the HAPMS database, those individuals working in the fields of road safety and maintenance on the trunk road network will have desktop access to data on injury and fatal accidents

2.6.8.1 Accident Data available within HAPMS

The accident data in HAPMS relates only to reported injury accidents (no damage-only data are included). The current policy is to accept only validated data into the HAPMS system. This validation exercise is undertaken annually and the data made available in June of the following calendar year. The earliest year that data is available for is 1994

2.6.8.2 Accessing Accident Data using HAPMS

To obtain access to this newly available data, users are directed in the first instance to ServiceDirect (0113-2541140) with details of your requirements. (Note that the data is automatically available to existing HAPMS users).

2.6.8.3 Source of the accident data

The data is from the national STATS19 injury accident database. This is a database held by the Department for Transport and contains all the objective information recorded by the police when a road traffic accident is reported. The STATS19 form consists of attendant circumstances, a vehicle record for each accident-involved vehicle and a casualty record for each casualty, and can be found on the DfT website.

2.6.8.4 Advice on data usage

This is contained in the operational folder which can be found on the DfT website.

2.6.8.5 Limitations on the Use of the Accident Data in HAPMS

The accident data has been assigned to the HAPMS sections using an algorithm which looks at the accident OSGR and the road name to locate the accidents on the Highways Agency network. The accident data has been allocated sections on the basis of Ordnance Survey Grid Reference (OSGR), provided the supplied OSGR information on the STATS19 form is within a defined tolerance of an appropriate section. If an OSGR is not accurate or other data used by the algorithm is ambiguous or incorrect, this can result in accident data being assigned to the wrong section or to no section at all. This is potentially a particular problem for dual-carriageway section assignments (care should be used if analysing dual-carriageway sections separately) and in the vicinity of junctions (where, for example, the accident data can be 'fitted' to the slip road in error).

2.6.8.6 Other Sources of Trunk Road Accident Information

For additional accident information please continue to use:

- Summaries of the injury accident data relating to the motorway and trunk road network available in the operational folder (which can be found on the Highways Agency web site).

2.7 Data Management

2.7.1 General Principles

The data contained within the operational databases of the Highways Agency represents a substantial investment in both time and money on the part of the Highways Agency and its Service Providers. In order to realise the value of this investment it is important that both parties recognise the value of the operational data and take steps to ensure that decisions taken as part of the day-to-day management of the Network are supported by up to date and accurate information.

Management of the Highways Agency's operational data requires awareness of both the existing data held within the operational databases and new data sourced from surveys, as-built records, etc. This section provides guidance on the roles and responsibilities with regard to data management and sets out the general allocation of such roles and responsibilities between the Highways Agency and its Service Providers.

2.7.2 Highways Agency Role

The Highways Agency provided the initial population of the HAPMS database from data supplied by the incumbent Service Providers at the time of the system launch. Since that date the Highways Agency through the HAST has provided the Service Providers with a collection of tools to enable the Service Providers to fulfil their responsibility to maintain, complete and report on the data.

The Highways Agency centrally procures and manages the annual TRACS and SCRIM contracts provide condition and location referencing information (in the form of the 1:2,500 idealisation) through HAPMS.

The Highways Agency also makes available within HAPMS the STATS 19 accident record as provided by the DfT. This dataset is limited to Personal Injury Accidents (those classified as Fatal, Serious or Slight) identified as occurring on the trunk road network. Chapter 2.6.8 describes the business applications and background to this functionality.

2.7.3 Service Provider's Role

As with all of the Highways Agency operational databases, the full business value to the user community (the Service Providers) and the owner (the Highways Agency) can only be achieved if the underlying data are substantially correct and complete. The Service Provider as the delegated maintainer of the trunk road network has responsibilities to ensure that the Highways Agency's data are up to date and accurate (to the required quality as defined by their respective contract).

2.7.4 As-built Records

It is the responsibility of the Service Provider to ensure that the data within the Highways Agency's databases are up to date and accurate. This includes the incorporation of any changes to the Network information resulting from maintenance carried out on the Network as well as from the implementation of new construction as a result of TPI (Targeted Programme of Improvements) and related schemes.

In the case of changes instigated by third party consultants/designers it is the responsibility of the Service Provider to ensure that they are aware of changes to the physical make-up of their Network. All as-built records will be provided to the Service Provider who must update the information within HAPMS as required.

It is the responsibility of the Service Provider, in their role as Network Manager, to ensure that all the information required to maintain an accurate representation of the Highways Agency's assets are provided.

Facilities within the HAPMS software are provided to update and maintain the following information:

- Construction: HAPMS contains the definitive record of the physical construction of the carriageway asset. It is the responsibility of the Service Provider to ensure that layer and material information, including date of construction, are complete and are updated following completion of maintenance or improvement schemes.
- SCRIM IL: HAPMS contains the definitive record of SCRIM Investigatory Levels for the trunk road network. It is the responsibility of the Service Provider to ensure that all IL's reflect the correct application of the Highways Agency's current policy.
- Speed Limits: HAPMS contains the definitive record of speed limits on the trunk road network. It is the responsibility of the Service Provider to ensure that the speed limit data is updated following the completion of maintenance or improvement schemes.
- Inventory: HAPMS contains the definitive record of carriageway related inventory (as defined by the RMMS manual) for the trunk road network. It is the responsibility of the Service Provider to ensure that the records contained within this central repository are updated following the completion of maintenance or improvement schemes.
- Lane Geometry: HAPMS contains records of lane geometry and widths within the **XSP Detail** section attribute. Service Providers are required to maintain the carriageway width (and lane width) information within this attribute. The Service Provider must ensure that lane geometry information is maintained and updated following the completion of maintenance and improvement schemes.

2.7.5 Fitting data to the Network

This section deals with the business and technical processes for fitting a survey to the defined Network. Tools are provided within HAPMS for the definition of survey routes, which are then used by MSP to fit the measured condition to the Network. Chapter 2.11 of this document provides a description of the MSP software.

The MSP user manual describes the technical process of fitting a survey to the Network. This document describes the business processes for dealing with surveys which do not 'fit' and sets out the actions the Service Provider is required to undertake to resolve these issues.

It is important to note that the Network Referencing Data held within the HAPMS database is regarded by the Highways Agency as the definitive description of the trunk road network and this definition includes the recorded section lengths.

For each type of condition survey, fitting tolerances are defined for the purposes of loading condition information against sections stored within HAPMS. For example the current tolerances for the fitting of TRACS survey information is 10% for sections that are less than 500m in length or 50m for sections longer than 500m.

Surveys which fall within tolerances are then "rubber-banded" (see figure 2.7.5) to fit within the chainage limits of the section. Surveys (or data) with chainage measurements outside these tolerances are initially rejected and require further checking as described in the next two sections.

Figure 2.7.5 demonstrates the principles of rubber banding data to the Network.

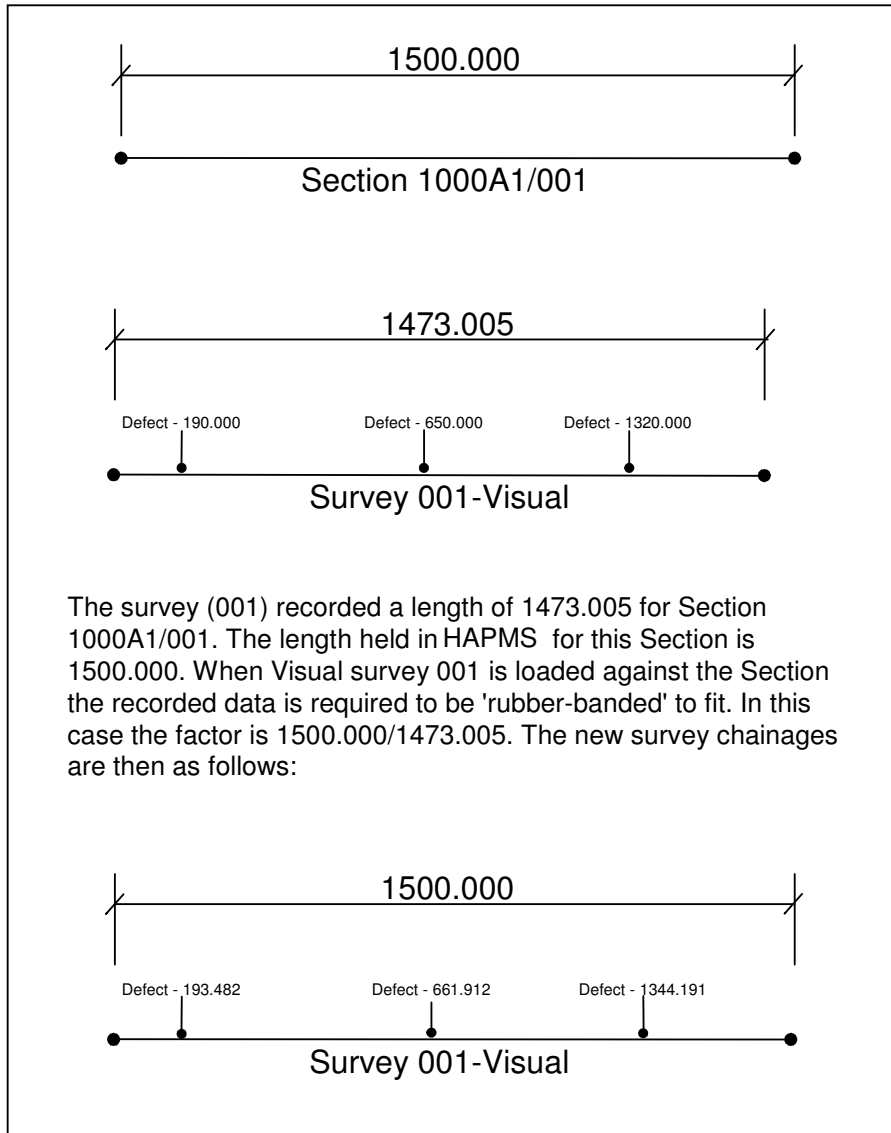


Figure 2.7.5: Principles of Rubber-banding

2.7.6 Fitting Highways Agency procured data

The TRACS and SCRIM survey contracts are managed centrally by the Highways Agency. The survey contractor fits the survey data to the Network, and the results are provided to the Service Provider. The HAST undertakes an audit on the fit and 'acceptability' of the TRACS data prior to accepting the data for use by the Service Provider.

Where the survey contractor identifies a section which is perceived to be incorrect within HAPMS, the HAST will liaise with the Service Provider's NRM to resolve this. Upon receiving a request for clarification from the HAST the Service Provider must reply within 20 days, providing the following information:

- Section length
- OSGR locating the Section Reference Marker at the section's start
- OSGR locating the Section Reference Marker at the section's end

OSGR's must be measured with differential GPS. The OSGR recorded as the LRP at the start or end of the section may be taken at any point on the cross-sectional line passing through the Section Reference Marker within the extent of the carriageway, and be within 0.25m of that cross-sectional line.

2.7.7 Service Provider Procured Surveys

In the case of scheme specific surveys such as Deflectograph, and where the Service Provider user is attempting to bulk update the construction records as a result of a Ground Penetrating Radar (GPR) survey, it is the responsibility of the Service Provider's NRM to ensure that any new data is fitted to the Network.

It is not acceptable for a section to be temporarily recalibrated for the purposes of fitting data.

Users concerned about fitting either survey data or bulk updates to section attributes such as construction or inventory, should in the first instance contact ServiceDirect Team (0113-2541140); E-mail: ServiceDirect@highways.gsi.gov.uk

2.7.8 Timeliness

The Service Provider is responsible for the accuracy and completeness of the data held within the HAPMS databases and is contractually obliged to maintain this on behalf of the Highways Agency over the life of their contract.

The Service Provider is also required to ensure that any changes to Highways Agency owned data that occur during the contract period are reflected in the relevant asset database. In meeting this obligation the Service Provider must accurately and completely update the relevant asset record within 20 days of the completion of the works or condition survey.

2.8 Pavement Condition Surveys

2.8.1 Background

Following the introduction of the Road Users' Charter and the coincident move by the Highways Agency to be a service based organisation, there has been a change of emphasis on the determinants for maintenance intervention. This recognises that the road user is concerned only with the surface condition of the road.

This section describes the strategy for Pavement Condition Surveys, which is fully supported by the facilities provided in HAPMS.

For the purpose of clarity, a differentiation is made between surveys and inspections:

Surveys	Defined as the collection of data either by machine or visually. Machine surveys are the collection by machine of measurements. Visual surveys are a mixture of assessments and measurements, with data capture possibly by hand-held computer
Inspections	Defined as viewing of the relevant length of road, either on foot or from a slow moving vehicle, to apply and to record judgements but not to collect data

2.8.2 Pavement Condition Survey Strategy

There are two levels of pavement condition survey:

- Network level
- Scheme level

All network level pavement issues (for example, network level reporting, budget planning, targeting of priority lengths for treatment) will be based on the data collected by the Network level surveys See Figure 2.8.1.

Any additional data required to define/design individual maintenance scheme will be collected by the scheme level surveys. The actual scheme level condition surveys required to be undertaken for each individual scheme will vary from scheme to scheme.

Lengths of road that will be candidates for treatment will be defined by the relevant maintenance engineer, and will include those lengths identified by the Network surveys and any other lengths that the maintenance engineer wishes to consider for other reasons.

After the Network level surveys, and prior to the confirmation that any length of road is considered a candidate for treatment and subject to scheme level surveys, an inspection must be carried out by an engineer (or experienced Inspector). This inspection must formally confirm that the length identified from the Network surveys, or by other means, is a proper candidate for treatment and give the engineer or Inspector's considered views of other elements of the proposed work, which are currently considered as part of the Value Management exercise.

2.8.3 Network Level Surveys

The network level machine surveys are:

- TRACS - undertaken on the entire network each year and for multiple lanes.
- SCRIM - currently carried out notionally on one third of the Network each year in the most heavily trafficked lane, usually lane 1.

The Highways Agency centrally procures and manages the annual TRACS and SCRIM surveys.

2.8.4 Scheme Level Surveys

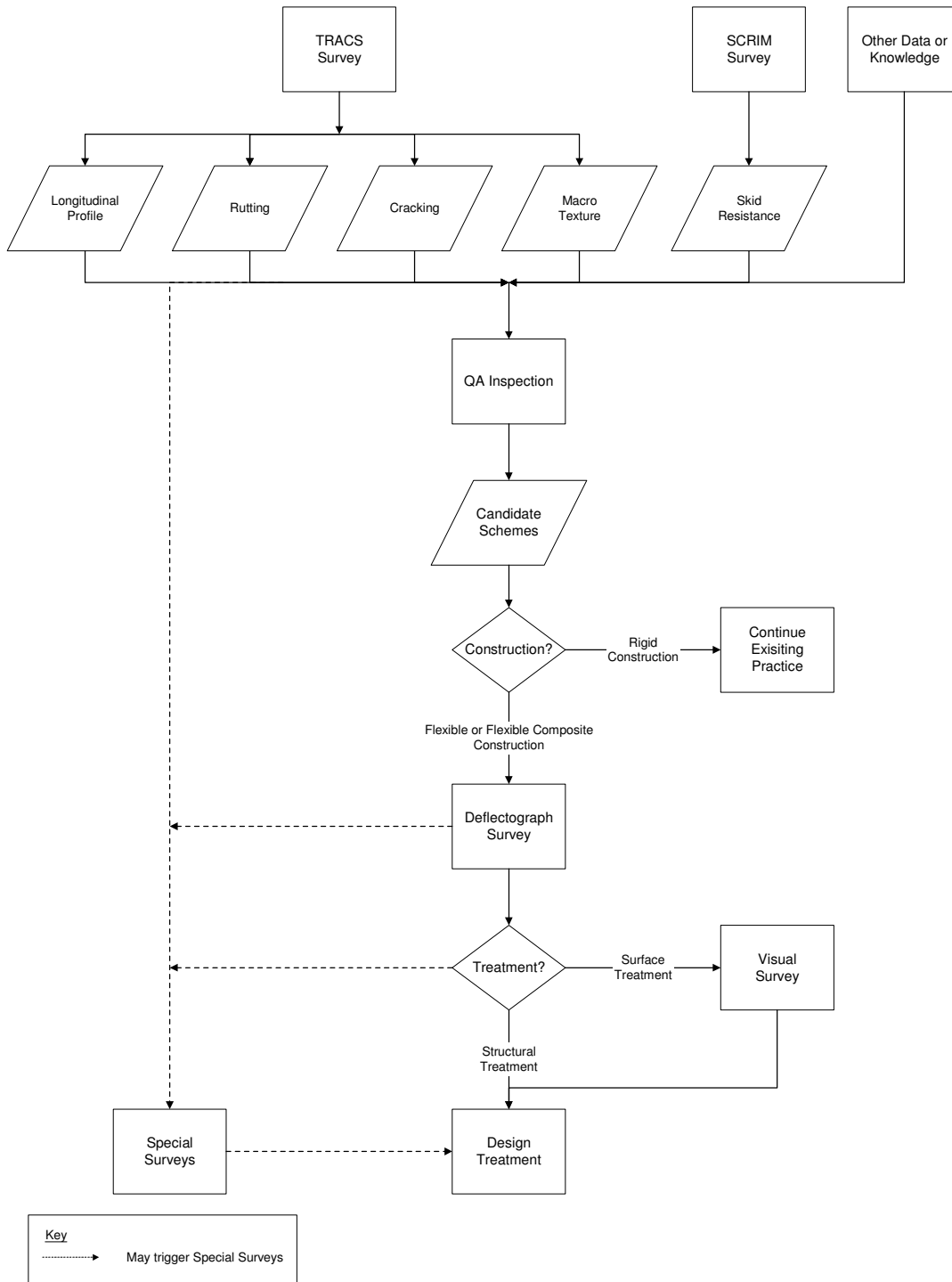
The range of scheme level surveys includes:

<ul style="list-style-type: none"> Deflectograph 	<p>For all schemes other than existing rigid construction, providing data that is needed to assess the structural condition of the pavement and to determine whether the pavement is, or remains, long life</p>
<ul style="list-style-type: none"> Visual Condition Surveys 	<p>For flexible pavements requiring surface treatment, providing data to establish the preferred option for surface treatment for the scheme. The survey will vary in content depending on the existing pavement construction. If possible, the visual condition survey should be undertaken at the same time as other Scheme level surveys to limit the number of lane closures.</p>

In addition, special surveys that are relevant to a particular scheme, or options for a scheme, may be undertaken including:

- Falling Weight Deflectometer (FWD)
- Ground Penetrating Radar (GPR)/Seismic
- Dynamic Cone Penetrometer (DCP)
- Coring or trial pits (including any subsequent laboratory testing of samples)
- CCTV surveys of drainage pipe runs
- Topographical surveys

Figure 2.8.1 Pavement Condition Survey Strategy



It is intended that data from scheme level surveys (including Special surveys) will supplement the data available from the Network level surveys, which will be available (other than crack intensity) at a disaggregated level for scheme consideration. It should be noted that the data from the Special surveys cannot be stored in HAPMS at present but the Service Provider must retain this data for possible future inclusion in HAPMS

2.8.5 Survey Procedures

All surveys must be carried out in accordance with Volume 7 of the Design Manual for Roads and Bridges.

2.8.6 Bar Code Plates

It should be noted that the five-digit bar code plates (that were used for section referencing for HRM surveys) are no longer used and should not be replaced if removed as a result of normal Service Provider activities.

2.8.7 Submission of Bids for Pavement Condition Surveys

All guidance on the preparation and submission of bids is provided in the documents referred to in Chapter 10.

2.9 Visual Surveys (Flexible)**2.9.1 Background – HAPMS Survey Strategy**

The Highways Agency has adopted a survey strategy comprising annual, high-speed network level surveys (TRACS and SCRIM) and further investigations on areas of the Network identified as possible candidates for planned maintenance schemes.

Although the survey strategy gives prominence to the role of machine-based surveys, there is still a need for visual surveys to collect those data that cannot currently be collected by machine:

1. Pavement Visual Surveys provide information, supplementary to that provided by network machine surveys, to support the design, evaluation and audit of potential maintenance schemes on flexible carriageway pavements (PVS-f). Please note that there is a proposal for an equivalent survey for concrete carriageway pavements to be defined but that, until this is available, the Service Provider must continue with existing arrangements using the Visual Condition Survey.
2. Network Visual Surveys (NVS) of those parts of the Network that are not covered by machine surveys (kerbs, footways, cycletracks and hard-paved verges) for the Highways Agency's reporting on performance of that network.

Figure 2.9.1 describes the HAPMS survey strategy, and illustrates the role of the two visual surveys within this strategy.

2.9.2 Timing and Frequency of Surveys**a. Pavement Scheme Visual Surveys of Flexible Carriageways (PVS-f)**

Scheme visual surveys must be carried out at locations on flexible surfaced carriageways where maintenance schemes are being considered. These surveys may be limited to lengths and lanes rather than to whole carriageways or sections. Visual surveys used to support the evaluation of scheme bids must have been carried out and loaded into HAPMS no more than 12 months prior to the date of the first "snapshot" of the forward programme given in the Programme Objectives Guide.

b. Network Visual Surveys

Network Visual Surveys must be programmed so that the whole of the network of off-carriageway items are covered over a two year period. 50% of those sections requiring survey must be inspected each year within those two years.

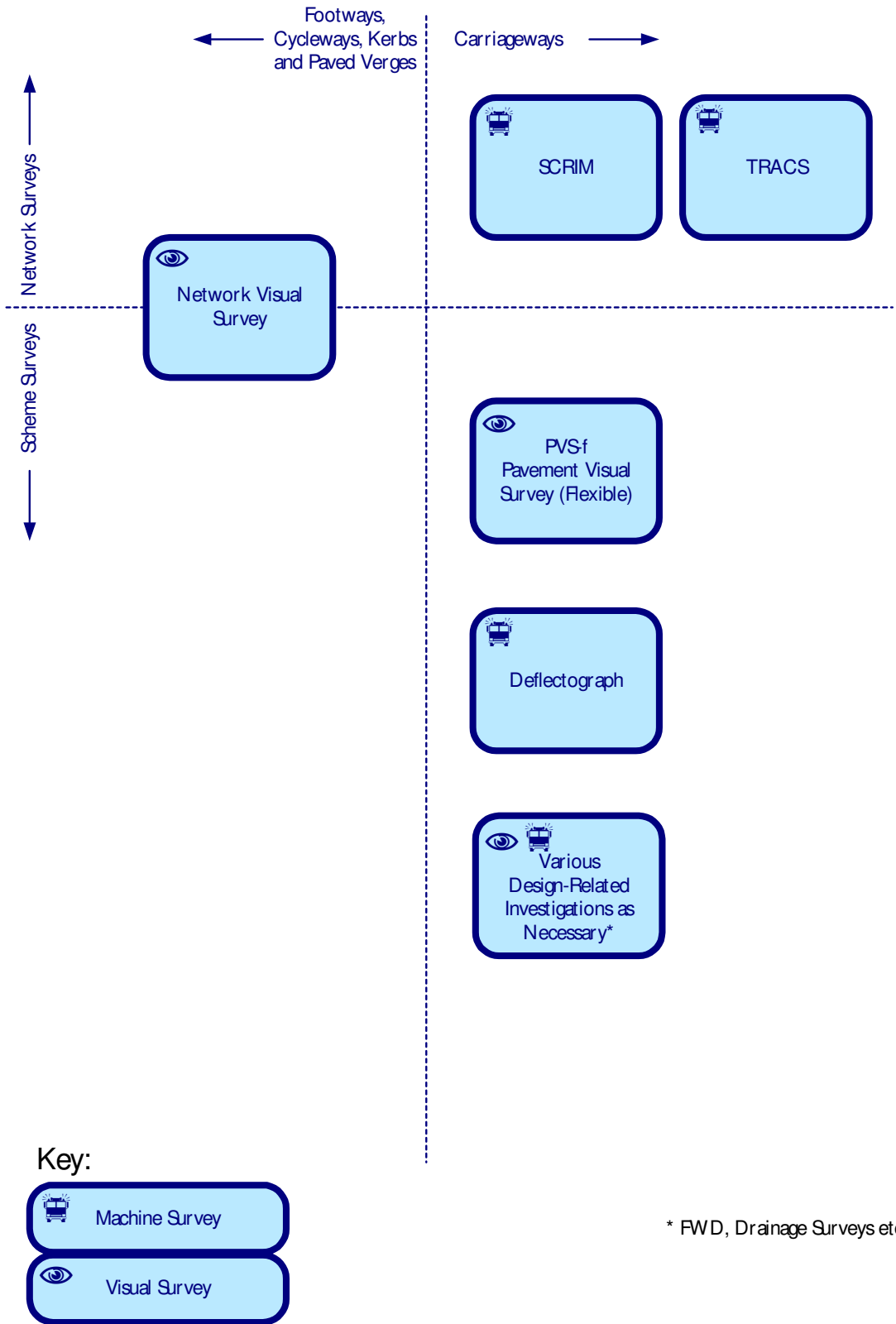


Figure 2.9.1 HAPMS survey strategy

2.9.3 Concrete Carriageways

The PVS-f survey is only applicable to flexible carriageway pavements. VCSs of concrete pavements as described in Chapter 2.10, must continue.

2.9.4 Visual Survey Software

The Highways Agency provides the following software for the purposes of undertaking HAPMS Visual Surveys.

DCD Software, Version 2.01a.HA

Functionality has been provided within the HAPMS system that must be used for the definition and outputting of survey routes to the handheld computer, and for loading of completed surveys, from the handheld computer.

2.9.5 Survey Procedures

NVS and PVS-f Visual Surveys must be carried out in accordance with the provisions of the HAPMS Visual Survey Manual.

2.9.6 National Road Maintenance Condition Survey (NRMCS)

The Highways Agency is still actively participating in the NRMCS. TRACS and SCRIM surveys will provide the data for the carriageway condition used in the NRMCS.

2.10 Visual Condition Surveys (VCS) on Concrete Surfaced Pavements

2.10.1 Roads to be Surveyed

All concrete surfaced carriageways of motorways and all purpose trunk roads must have a visual condition survey. On heavily trafficked motorways and dual carriageways where significant delays occur during daytime lane closures, VCS must be carried out at night.

2.10.2 Extent and Frequency of Surveys

In order to obtain sufficiently detailed condition data to support major maintenance schemes, surveys must be carried out over the length of the identified scheme, and must be no older than 1 calendar year at the time of Scheme appraisal.

2.10.3 Inspection Procedures

VCSs must form part of the inspection procedure to be adopted before the opening to traffic of newly laid concrete surfaced pavements and must also be carried out at the end of the Contract maintenance period. The surveys must be carried out by the Service Provider and the consultant/designer (if one is appointed) following agreement with the Service Manager, and inspection records must be kept by the Service Provider.

2.10.4 Surveys

Procedures and methods for carrying out VCSs for concrete surfaced pavements (including CRCP) are fully described in the DMRB: Volume 7, section 3, and Part 2 HD29/94.

2.10.5 Recording the Survey Data

The Service Provider must retain a fair copy of the 1:100 scale field inspection sheet. Note: this data can be held electronically. Two copies of the pavement construction data and defect summaries must be submitted to the Service Manager within three months of the completion of the survey.

2.11 Machine Survey Pre-processor (MSP)

2.11.1 Introduction

The Highways Agency's MSP is a stand-alone software application that is to be used by the Service Provider or by the Service Provider's survey contractors, to process data from SCRIM and Deflectograph surveys prior to loading into Confirm.

The software is also being used by the Highways Agency's TRACS Contractor to process the TRACS data prior to loading into Confirm.

In summary, MSP:

- Reads in and validates the format and consistency of Raw Condition Data (RCD) collected by the relevant survey machines;
- Validates the measured values;
- Carries out corrections to, and/or some analysis of, the measured values ;
- Maps the survey to a Survey Route, defined within a file; and
- Outputs the corrected/analysed data and mapping information as Base Condition Data (BCD), for subsequent loading into Confirm.

2.11.2 Accessing MSP

MSP is a stand-alone application that can be installed on any PC whether connected to the Highways Agency Extranet or not. Service provider users were provided with a copy of the MSP application and a User Guide at the training courses that accompanied its rollout.

Any requests for help in using MSP, including requests for additional copies of the software, should be directed to the Highways Agency ServiceDirect helpdesk (Telephone 0113-2541140); E-mail ServiceDirect@highways.gsi.gov.uk

2.11.3 Corrections and Analysis

The corrections and/or analysis carried out by MSP are:

TRACS data

- Filtering of the GPS co-ordinate data
- Calculation of three longitudinal profile variances (normally 3m, 10m and 30m), averaged over fixed lengths (normally 10m)
- Calculation of rut depth in each wheel track, averaged over fixed lengths (normally 10m)
- Calculation of texture depth (either SMTD or MPD) and percentage fretting, averaged over fixed lengths (normally 10m)
- Calculation of cracking intensities for the whole carriageway, left wheeltrack and right wheeltrack, over fixed lengths (normally 10m)
- Calculation of predicted noise, averaged over fixed lengths (normally 10m) together with estimated surface type
- The geometric data (gradient, crossfall and radius of curvature) and individual cracks recorded by TRACS are also output (without correction/analysis)

SCRIM data

- Correction for static calibration
- Correction for Distance Calibration Factor

Deflectograph data

- Correction for static calibration
- Correction for wheel load
- Linear interpolation of temperature
- Correction for Distance Calibration Factor

2.12 Records and Inspections of Highway Structures**2.12.1 General**

The overarching principles for the provision and maintenance of records and inspections for trunk road structures throughout the UK are set out in BD62 'As Built, Operational and Maintenance Records for Highway Structures', BD63 'Inspection of Highway Structures', and BD53 'Inspection and records for Road Tunnels'.

Records for new build, modifications and renewals works to trunk road highway structures in England are required by BD62 Annex A to be supplied and input into SMIS by the organisation responsible for the design of the works (the Designer), taking account of SMIS online User Guidance. For network improvement and maintenance works carried out under Service Provider contracts, the Service Provider will be responsible for ensuring that his Designer fulfils this duty.

Compliance with this Section 2.12 in relation to inputting of records into SMIS, and with the related SMIS User Guidance, is deemed to represent the minimum compliance with BD62. The requirements of this Section 2.12 and those of BD62, BD63 and BD53 supersede those in IAN38/01, IAN45/02, IAN 62/05 and IAN 67/05, which are hereby withdrawn.

The acceptance into SMIS of records for new build, modifications and renewal works, together with the upkeep of operational records in SMIS, is the responsibility of the Service Provider, who must take reasonable steps to satisfy themselves that SMIS is populated correctly at all times.

SMIS is administered by SSR on behalf of Traffic Operations Directorate. The following table summarises the key contacts relating to SMIS queries.

Table A SMIS Contacts

Subject Area	Contact
Engineering issues and Access	SMIS Administrator: smis@highways.gsi.gov.uk
Software or other usage issues	ServiceDirect: tel: 0113 254 1140

2.12.2 Scope of Highway Structures

The scope of highway structures for which records must be held and maintained in SMIS, and inspections undertaken is given in BD62 Annex A Table 4. The normal maintenance inspection regime of General, Principal and Special Inspections in accordance with BD63 must apply to each Structure Type shown in the Table, except as indicated below:

- Small Span Structures (formerly 'Small Culverts'). For Bridges and Buried structures between 0.9m and 1.8m span, Principal Inspections are not required, except for corrugated steel culverts, in which case the normal maintenance inspection regime must apply.
- Masts. Posts for Highway Signs are not recorded on SMIS and are not covered by the SMIS inspection process.
- Tunnels. General, Principal, Special, and M&E Inspections must be in accordance with BD53 'Inspection and Records for Road Tunnels'
- Service Crossings and Other Structures. For other structures not defined in the Table but needing technical approval the Service Provider must contact the SMIS Administrator.

2.12.3 Type of Records required in SMIS

The type of as built, operational and maintenance structure records to be held are described in Section 4 of BD62 and must be maintained by the Service Provider within the relevant branch of

the SMIS hierarchy, as explained in SMIS User Guidance Volume 1 under “BD 62 Requirements” and in the SMIS Designer Guide under “Introduction”. The Service Provider must ensure that document records that they upload into the Structure File Branch are located in the correct subfolder.

Where bridge and culvert structures are modified to cater for road widening, the new construction must be input as part of the existing structure.

2.12.4 Data input to SMIS for new build, modifications and renewals

For structures new build, modifications and renewals, Designers are required to submit the necessary inventory details and Structure File records within the timescales stated below, as set out in BD62 Annex A :

- An Early Notification spreadsheet for each new structure, at the time of Approval In Principle submission for the structure, sent to relevant Highways Agency Technical Approval contact.
- The structure inventory data, at least one month before the planned Pre Opening Inspection, POI (refer to BD63), by direct input into SMIS.
- Structure File documents for the completed works, no later than three months from the opening of the structure to traffic, as electronic files either direct into SMIS or on CD to the SMIS Administrator.

With respect to item 2 above the Service Provider must confirm within SMIS, as part of his POI duties, the acceptance of the completed data input.

For new structures, the Service Provider must liaise with the Designer so that the Designer can establish an acceptable referencing system for the structure for SMIS inventory and inspection recording purposes.

For modifications and renewals to existing structures (including widenings) it is essential that the Service Provider “migrates” the component hierarchy (ie amend for condition reporting) of the structure before the Designer inputs the modification data. The Designer and Service Provider must therefore liaise at a sufficiently early date to enable this to be done. This requirement is also stated in the SMIS Designer Guide Section 6.

2.12.5 Supply of Structure Records in Connection with Changeover of Responsibility

Records at Transfer of HA Structures to the Ownership of Others

Where a new structure has been constructed under an HA contract, but ownership is to be transferred to a third party, full data and documentation is supplied by the Designer in accordance with BD62.

Where an existing structure is to be transferred to a third party, the Service provider must update the data and documentation in SMIS, prior to transfer (See 2.12.7).

Where necessary, the SMIS Administrator can supply a Structure Report to the responsible HA officer as a summary record of the SMIS inventory for the structure.

The HA officer must notify the SMIS Administrator of the date of the change of ownership of the structure not later than one week after the transfer.

Records at the Transfer of Existing Third Party Structures to the Ownership of the Highways Agency

When transfer of ownership from a third party to the HA is to take place, the Service Provider must apply to the SMIS Administrator for a new Structure Key and, at least one month prior to the planned handover inspection, create a suitable inventory in SMIS. Following the handover inspection (refer to Acceptance Inspections in BD63), the Service Provider must input the inspection records into SMIS in accordance with 2.12.8.

2.12.6 Supply of Records for Structures on the HA Network Owned by Others

For newly built structures over, under or adjacent to the highway but owned by others, on instruction from the Area Manager or other authorised person the Owner should supply to the Service Provider, and the Service Provider obtain from the Owner, within three months of substantial completion of the structure, summary information about the structure for inputting into SMIS, comprising:

- a. A completed Early Notification of Structure spreadsheet, which should be obtained from the SMIS Administrator.
- b. Minimum headroom information for each span over the road, rail or navigable waterway.
- c. Three electronic Report Images required for the 277(SMIS) Report. These are a 1:2500 scale map of the vicinity, a general elevation photograph and a general arrangement drawing. Agents should agree the format of these images with the Owner, giving due consideration to the guidelines in the SMIS User Guides.

Where the Service Provider is able to acquire this information it must be entered onto SMIS correctly and without delay. Where the Service Provider is unable to obtain this information from the owner, the Service Provider should on instruction from the Area Manager or other authorised person, create and input this information to SMIS.

2.12.7 Supply and Upkeep of Operational Records for Existing Structures

As part of the ongoing management cycle of a structure, SMIS contains various functions for use by the Service Provider. Requirements for these are summarised in sub-section 2.12.7.

Maintenance Inspections

The Service Provider must carry out Maintenance inspections in accordance with BD 63 and must input information from General, Principal and Special Inspections directly into SMIS in accordance with 2.12.8 below.

The Service Provider must complete and “authorise” Inspections in SMIS within three months of the inspection taking place.

The Service Provider must use the inspection scheduling facility in SMIS for inspections and monitoring.

Where a Service Provider is responsible for maintenance of a new structure, the initial Acceptance Inspection should be the Pre Opening Inspection (POI) (see BD63 Section 5). This inspection must constitute the commencement of the programmed General and Principal Inspection intervals. The POI may be either a General Inspection or a Principal Inspection although should normally be a Principal Inspection, but it must in all cases be sufficiently detailed to enable the Service Provider to fulfil its responsibilities of future maintenance and management of the structure.

Monitoring Inspections are separately identified in SMIS and are recurring Special Inspections for the management of substandard structures.

Maintenance Actions

Maintenance Actions are created in SMIS as recommended actions to deal with particular maintenance needs, for entry onto the Highways Agency's Structure Renewals Programme. The Service Provider must create these within SMIS, in accordance with the onscreen guidance, either:

- During the inspection inputting process.
- During the development of the planned forward programme.
- Independent from the inspection screens (e.g. following an assessment or incident).

The Service Provider must review and accept Maintenance Actions within three months of the action being identified. Where Maintenance Actions are identified at the time of a maintenance inspection, the Service Provider must undertake this review before the inspection input is "authorised". The Service Provider will need to allocate staff with the "engineer" user role to undertake these duties on their behalf.

Developing Maintenance projects

The Service Provider must use the Project Forming, Estimating, Scheduling and Bidding, and Continuous Value Management functions in SMIS as required by the Highways Agency as part of the effective management of the structures asset.

Ongoing Review of SMIS Inventory

The Service Provider must take the opportunity to check and update relevant parts of the SMIS inventory whenever current information can be checked or ascertained during normal operational activities. This should be at least on the following occasions:

- a. Before "authorising" a Principal Inspection input into SMIS (eg physical details and images).
- b. Within two months of completion of maintenance schemes (eg additional or amended physical details and images).
- c. Within two months of input of inventory information into SMIS by Designers (ie acceptance of Designers data and records input).
- d. Where existing structures have yet to be converted to component level inspection, at initiation of the component level inspection regime (ie instigate component hierarchy and ensure physical data is attributed correctly within the hierarchy).
- e. Before data for a modified structure (eg widening) is input by the Designer. (ie "migrate" (for condition reporting purposes) the component hierarchy if not already done).
- f. Where an existing structure is to be transferred to a third party, the Service Provider must update the data and documentation in SMIS prior to transfer.
- g. Upon receipt or known creation of any more recent information or on recognition of any incorrect information.
- h. Within one week of the physical addition or removal of any Interim Measure.

Structural Assessments and Load Management

The Service Provider must input Assessment records from the Steady State Assessment Programme into SMIS through the Load Management section and the Structure File section as appropriate. Submission of paper AHS/2 forms as a record of new assessment information is no longer required.

Advice in the SMIS User Guidance Volume 4 - Operational must be followed regarding the Load Management.Summary section

2.12.8 Maintenance Inspections

The Service Provider must use the inspection and monitoring scheduling facility in SMIS for planning and programming maintenance inspections.

The Service Provider must undertake all inspections as “component level” inspections and defect information (ratings, images etc.) recorded against the component referencing system for the structure within SMIS, as set out in the SMIS User Manual and on screen guidance. The Service Provider must “authorise” Inspection data within three months of the inspection taking place.

General, Principal and Special Inspection reports, can now be generated from SMIS. Bound paper reports for these inspections need not be submitted to the Highways Agency, unless specifically requested by the appropriate HA staff.

Where some inspections require additional information beyond that for which there is functionality in SMIS for keyed input, (e.g. Acceptance Inspections, enhanced maintenance inspections etc), a report prepared externally to SMIS may be created and submitted to the HA for acceptance and then uploaded into the relevant section of the Structure File in SMIS.

At handover of new structures to the Service Provider, the Service Provider must confirm in SMIS, as part of his POI Acceptance Inspection duties, their acceptance of the Designers completed data input for the structure.

2.12.9 Identification Markings

Service Providers must carry out the identification marking of highway structures in accordance with BD45. Identification of new structures must be carried out at the same time as the first Principal Inspection.

2.13 Drainage Records & Inspections**2.13.1 General**

It is essential to have accurate data on the location and condition of highway drainage assets in order to plan ordered and cost effective maintenance. Data gathered must be stored in a manner that permits quick and easy access and in a format that is readily understandable to the Service Provider and Highways Agency irrespective of the data source.

HD 43 defines the data to be collected and the way in which it should be recorded. Data storage software is not specified, but a Geographical Information System (GIS) **MUST BE USED**. The Highways Agency will provide a GIS to ensure national uniformity within its network.

2.13.2 Data Collection & HADDMS

Information relating to highway drainage items can be obtained from a number of sources and in a variety of formats.

The Service Provider is responsible for collating drainage data from all available sources and also selecting which data is to be included with the Highways Agency Drainage Data Management System (HADDMS).

Data from existing RMMS systems may be transferred into HADDMS and CCTV surveys may also be used as a means of data collection.

2.13.3 Inventory

HD 43 identifies the types of drainage inventory items to be included and are classified as either 'point', 'continuous' or 'region' items.

Definitions are provided for point items e.g. manholes, continuous Sub-surface items e.g. culvert, continuous surface channels e.g. swales, continuous surface water & sub-surface channels & drain Items e.g. filter drains, and region Items e.g. sedimentation pond.

2.13.4 Record Types

HD 43 also identifies the attributes to be recorded for all inventory items be they 'point', 'continuous' or 'region' items.

2.13.5 Data Referencing

HD 43 lays down the requirements for the referencing of each item based on its position relative to the Ordnance Survey Grid.

2.14 Geotechnical Asset Information Management

2.14.1 General

The operational database for the management of geotechnical asset information is the Highways Agency Geotechnical Data Management System (HAGDMS). It is important that all parties recognise the importance of the data and take steps to ensure that decisions taken as part of the day-to-day management of the Network are supported by up to date and accurate information.

This section provides guidance on the general roles and responsibilities with regard to data management and sets out the general allocation of such roles and responsibilities between the Highways Agency and the Service Provider.

2.14.2 Overview of System

The primary purpose of the system is as an electronic data and risk management system to support the overall management of the geotechnical asset. For Service Providers, HAGDMS acts as the repository and means to manage the information required by HD41/03, 'Maintenance of the Highway Geotechnical Assets'.

It comprises a Geographical Information System (GIS) and the following component databases and datasets:

Geotechnical Asset Database (GAD): A national database functioning as an inventory of the geotechnical asset and its condition for the whole of the Network. It also contains functions to log geotechnical defects, manage their risk to the Network and provide records of remedial measures. Data dates from 2002 when the system became fully operational.

Reports Database: A national database of geotechnical reports and ground investigation data. Reports relate to the construction, improvement and maintenance of the entire Network. The Reports Database is also the repository for geotechnical reports and records that are stored in electronic (.pdf) format and are available to view on-line.

Boreholes Database: A national database of borehole locations abstracted from the archive of geotechnical reports. Electronic records are attached to a number of these in the form of borehole logs and AGS data (Association of Geotechnical and Geo-environmental Specialists).

Contacts Database: A database of registered HAGDMS users, British Geological Survey (BGS) Regional Geologists and key geotechnical contacts.

Third Party Datasets: The front-end user interface of the Geographical Information System (GIS) allows access to third-party datasets e.g. from the Ordnance Survey (OS), British Geological Survey (BGS), airborne laser scanning (LiDAR) surveys and high-resolution aerial ortho-photography. Compressed versions of digital aerial photo images of the whole network, extending approximately 1km either side of the highway, are a recent addition to the system. Highways Agency GDMS has been set up as a web-based system to make it as fully accessible as possible. The address is <http://www.hagdms.co.uk>.

2.14.3 Role of the Highways Agency

The Highways Agency is responsible for administering and developing the system and supporting the Service Provider to enable them to fulfil their responsibility to input, maintain and report on the data.

2.14.4 Role of the Service Provider

The Service Provider, as the delegated maintainer of the Network are responsible for ensuring that the data is accurate, complete and up-to-date (to the required quality as defined by their respective contract).

2.14.5 Access Arrangements & Contact

Any Service Provider is permitted to access the system. Both view-only and editing access rights may be granted depending on the individual's roles and responsibilities.

New users can request access to the system from the following points of contact:

- Staff of the Highways Agency should contact their local Geotechnical Advisor (GA)
- Staff of the Service Provider should contact their Geotechnical Maintenance Liaison Engineer (GMLE)

For further information on any other aspect of HAGDMS, contact David Patterson (Project Manager and Sponsor) of Highways Agency SSR AAG (Geo) in the Bristol Office. [GTN: 1371 8399 or david.patterson@highways.gsi.gov.uk]

For further information on procuring either geodetic or spatial data via the LiDAR Framework and its subsequent storage and retrieval, contact Chris Duffell of Highways Agency SSR AAG (Geo) in the Manchester Office. [GTN: 4315 5660 or chris.duffell@highways.gsi.gov.uk]

2.14.6 Liaison between the Highways Agency and the Service Provider

Liaison between the two parties on issues regarding geotechnical data must take place between the Geotechnical Advisor for the Highways Agency and the Geotechnical Maintenance Liaison Engineer (GMLE) (as defined in HD41) for the Service Provider. The Service Provider may also be required to liaise with the Highways Agency's Geotechnical Database Administrator, who has day-to-day responsibility for managing geotechnical data.

The duties of the Service Provider's GMLE are as follows:

- Liaise with the Geotechnical Advisor for the Highways Agency as required
- Ensure compliance with all data management specifications relevant to managing the geotechnical asset
- Act as focal point to receive any communications regarding development changes to HAGDMS and redistribute to all relevant personnel within the Service Provider's organisation
- Act as a focal point to receive any communications regarding changes to the specifications for data management related to geotechnical asset management data and redistribute to all relevant personnel within the Service Provider's organisation

2.15 Environmental Information System

2.15.1 General

The operational database for the management of environmental asset information is the Highways Agency Environmental Information System (EnvIS). EnvIS consists of specific environmental data supplied by Service Providers, the Highways Agency and other bodies that is collated and displayed in the Highways Agency Geographical Information System (HAGIS). This data is used to assist in managing the environment, within and surrounding the trunk road network and in the review and reporting of the environmental performance of both the Service Provider and the Highways Agency.

This section provides guidance on the general roles and responsibilities with regard to data management and sets out the general allocation of such roles and responsibilities between the Highways Agency and the Service Provider.

2.15.2 Overview of System

EnvIS data is categorised as either environmental inventory or environmental management information, which together, provide important details on the characteristics and management of Environmental Elements located within and surrounding the trunk road network. Environmental Elements are defined in IAN 84/07 as part of EnvIS environmental inventory and are man-made or natural assets comprising the environment within and surrounding the trunk road network.

Environmental Inventory – contains data, provided by the Highways Agency (e.g. national designations), Service Providers and other bodies, relating to the characteristics of specific Environmental Elements within the following environmental topics:

- Landscape;
- Nature Conservation and Ecology;
- Water;
- Cultural Heritage;
- Air Quality;
- Noise, and;
- Waste and Material Resources.

Environmental inventory specifically records the following information (where appropriate):

- an Element's classification and the status of that Element (what it is);
- an Element's specific location (where it is located), and;
- an Element's intended Highways Agency objective(s) and environmental objective(s) (why it is there).

Environmental management information – is data attached to individual Environmental Elements and assists in informing both the Highways Agency and Service Provider of the broad environmental management requirements of the trunk road network, and corresponding environmental performance.

For each Environmental Element, environmental management information specifically records the following information (where appropriate):

- details of any environmental commitments entered into;
- type of management actions undertaken for each Environmental Element in line with its Highways Agency and environmental objective(s);
- status of each management action;
- planned / actual date for completion of each management action; and
- condition and / or performance rating of each Environmental Element.

2.15.3 Roles and Responsibilities**General**

The Highways Agency's Service Manager and the Service Provider's Environmental Coordinator and / or the Service Provider's Area Environmental Manager have duties to ensure compliance with EnvIS as explained below.

Highways Agency

For completeness and to aid the Service Provider's understanding of the workings of EnvIS, the duties of the Highways Agency's teams are explained below. Contribution to and management of EnvIS is split across three parts of the Highways Agency namely: Policy; EnvIS Management Team (EMT), and; Information Directorate.

a) Highways Agency Policy

Policy will use EnvIS to actively monitor the performance of Environmental Elements, Service Providers and the Highways Agency to ensure compliance with stated aims and objectives. In coordination with the EnvIS Best Practice Group they will also make changes to EnvIS to reflect administration and Central Government environmental policy variations from time to time.

b) EnvIS Management Team

The EMT acts as the focal point of contact for all Service Providers maintaining and supplying environmental data to EnvIS standards. This team will monitor submission of data, assess the quality of data, and offer guidance on data quality and quantity issues. They will also offer guidance on interpretation of EnvIS standards. All contact and requests for data will be managed by this team and should be routed via ServiceDirect (Highways Agency helpdesk – 0113 254 1140 or <mailto:ServiceDirect@highways.gsi.gov.uk>).

c) Information Directorate

Highways Agency ID manages the processing of data submitted by Service Providers. It validates data on upload to the EnvIS databases and identifies errors and omissions. They will generate error reports for distribution to suppliers of data and will also generate and issue Highways Agency Unique ID numbers for all satisfactorily loaded environmental inventory data. Finally, they have responsibility for managing the national designation data in the EnvIS database.

Service Provider

The term Service Provider, is used to collectively describe both the Designer and Network Management Agent. Service Providers are required to collect, record, submit and utilise available EnvIS data in the course of network management.

The terms Designer and Network Management Agent relate directly to the type of work that is being undertaken. For example, a Service Provider working on a Design Build Finance and Operate (DBFO) project will undertake duties relating to both Design and Network Management during the life of a contract. Equally, if a Network Management Agent is undertaking renewals or improvement works, then the role of Designer will be assumed. This interpretation is important to remember when recording and submitting EnvIS data, as it means that a Service Provider is not exclusively a Designer or Network Management Agent, but can perform both roles during the course of a commission.

a) Designer

The term Designer, refers to the contracting agent carrying out design and construction activities

for or on behalf of the Highways Agency.

When undertaking the role of Designer, the Service Provider must collect, record, submit and utilise available EnvIS data in the course of project planning, design and construction.

b) Network Management Agent

The term Network Management Agent, refers to the contracting agent responsible for managing and maintaining the Network.

In his role as Network Management Agent, the Service Provider must collect, record, submit and utilise available EnvIS data in the course of Area maintenance and operation.

2.15.4 EnvIS Specialist Personnel Requirements

Environmental Specialists

Relevant environmental specialists, with the appropriate level of expertise, should be utilised in the application of the different environmental topics addressed by EnvIS. All environmental specialists must have relevant highway experience relating to detailed design, construction and maintenance. Annex E of HD 46 (DMRB 5.2.1) gives indicative levels of experience, professional status and competency that the Highways Agency considers necessary in fulfilling this role.

GIS specialists

The Service Provider must have access to a Geographical Information System (GIS) and specialist GIS trained personnel in order to record and assign correct geospatial attributes to Environmental Elements.

Database Administrators (DBA)

Service Providers may need access to DBA personnel in order to manage the standard set of look up tables and the necessary import and export routines for data transfer between the Highways Agency and Service Provider.

Analyst / Programmers

Service Providers may require analyst and programmer resources to develop local applications for assigning attribute data to Environmental Elements.

2.15.5 Access Arrangements & Contacts

EnvIS data is collected by both the Highways Agency and Service Providers, and is transferred between each party, in a prescribed format. The Network Management Agent must transfer data to EnvIS, as a minimum, at intervals as defined in the IAN 84/07. The Designer must submit EnvIS data at key milestones as defined in the IAN 84/07. This data is displayed by the Highways Agency in layers in HAGIS. Service Providers with extranet access will be able to view this data in an EnvIS view of HAGIS. Similarly, reports, generated from EnvIS data, will be available through HAGIS or by using standard reporting tools in the Highways Agency Management Information System (HAMIS). Data downloads will be undertaken by the Highways Agency on request from the Service Provider and dispatched on mutually agreed media.

Any Service Provider with existing access to Highways Agency GIS is permitted to access the system. New users can request access to the system through their nominated Company Highways Agency Liaison Officer (CHALO) and the completion of Highways Agency security and NUNS forms. See Part 11.4.7 for information on new account management.

For further information on any aspect of EnvIS, contact ServiceDirect (0113 254 1140) or mail to: ServiceDirect@highways.gsi.gov.uk

2.15.6 Liaison between the Highways Agency and the Service Provider

Should the Service Provider have any issues regarding EnvIS data any liaison with the Highways Agency must take place through the EMT. The Service Provider may also be required to liaise with the Highways Agency's EnvIS Database Administrator, who has day-to-day responsibility for managing EnvIS data This will also initially be through the EMT But in all cases, the initial point of contact is through ServiceDirect (as above) to help ensure issues and queries are properly managed.

Annex 2.3.1 Local Authority Area Codes

Area Code	Local Authority Title
0011	HIGHWAYS AGENCY
0016	WELSH OFFICE
0017	BAA
0018	M6 TOLL MOTORWAY (MEL)
0020	TRANSPORT FOR LONDON
0114	BATH AND NORTH EAST SOMERSET
0116	BRISTOL
0119	SOUTH GLOUCESTERSHIRE
0121	NORTH WEST SOMERSET
0225	BEDFORDSHIRE
0230	LUTON
0335	BRACKNELL FOREST
0340	WEST BERKSHIRE
0345	READING
0350	SLOUGH
0355	WINDSOR AND MAIDENHEAD
0360	WOKINGHAM
0430	BUCKINGHAMSHIRE
0435	MILTON KEYNES
0535	CAMBRIDGESHIRE
0540	CITY OF PETERBOROUGH
0645	CHESHIRE
0650	HALTON
0655	WARRINGTON
0724	HARTLEPOOL
0728	REDCAR AND CLEVELAND
0734	MIDDLESBOROUGH
0738	STOCKTON-ON-TEES
0800	CORNWALL
0835	ISLES OF SCILLY
0900	CUMBRIA
1050	DERBYSHIRE
1055	CITY OF DERBY
1155	DEVON
1160	CITY OF PLYMOUTH
1165	TORBAY
1245	DORSET
1250	BOURNEMOUTH
1255	POOLE
1345	DURHAM
1350	DARLINGTON
1440	EAST SUSSEX
1445	BRIGHTON AND HOVE
1585	ESSEX
1590	SOUTHEND-ON-SEA

Area Code	Local Authority Title
1595	THURROCK
1600	GLOUCESTERSHIRE
1770	HAMPSHIRE
1775	CITY OF PORTSMOUTH
1780	CITY OF SOUTHAMPTON
1850	COUNTY OF HEREFORDSHIRE
1855	WORCESTERSHIRE
1900	HERTFORDSHIRE
2001	EAST RIDING OF YORKSHIRE
2002	NORTH EAST LINCOLNSHIRE
2003	NORTH LINCOLNSHIRE
2004	KINGSTON-UPON-HULL
2114	ISLE OF WIGHT
2275	KENT
2280	MEDWAY TOWNS
2371	LANCASHIRE
2372	BLACKBURN
2373	BLACKPOOL
2460	LEICESTERSHIRE
2465	CITY OF LEICESTER
2470	RUTLAND
2500	LINCOLNSHIRE
2600	NORFOLK
2741	YORK
2745	NORTH YORKSHIRE
2800	NORTHAMPTONSHIRE
2900	NORTHUMBERLAND
3055	NOTTINGHAMSHIRE
3060	CITY OF NOTTINGHAM
3100	OXFORDSHIRE
3235	SHROPSHIRE
3240	THE WREKIN
3300	SOMERSET
3450	STAFFORDSHIRE
3455	CITY OF STOKE-ON-TRENT
3500	SUFFOLK
3600	SURREY
3700	WARWICKSHIRE
3800	WEST SUSSEX
3930	WILTSHIRE
3935	SWINDON
4205	BOLTON
4210	BURY
4215	MANCHESTER
4220	OLDHAM
4225	ROCHDALE
4230	SALFORD

Area Code	Local Authority Title
4235	STOCKPORT
4240	TAMESIDE
4245	TRAFFORD
4250	WIGAN
4305	KNOWSLEY
4310	LIVERPOOL
4315	ST HELENS
4320	SEFTON
4325	WIRRAL
4405	BARNSELEY
4410	DONCASTER
4415	ROTHERHAM
4420	SHEFFIELD
4505	GATESHEAD
4510	NEWCASTLE UPON TYNE
4515	NORTH TYNESIDE
4520	SOUTH TYNESIDE
4525	SUNDERLAND
4605	BIRMINGHAM
4610	COVENTRY
4615	DUDLEY
4620	SANDWELL
4625	SOLIHULL
4630	WALSALL
4635	WOLVERHAMPTON
4705	BRADFORD
4710	CALDERDALE
4715	KIRKLEES
4720	LEEDS
4725	WAKEFIELD
4900	DEFENCE ESTATES
5030	CITY OF LONDON
5060	BARKING AND DAGENHAM
5090	BARNET
5120	BEXLEY
5150	BRENT
5180	BROMLEY
5210	CAMDEN
5240	CROYDON
5270	EALING
5300	ENFIELD
5330	GREENWICH
5360	HACKNEY
5390	HAMMERSMITH AND FULHAM
5420	HARINGEY
5450	HARROW
5480	HAVERING

Area Code	Local Authority Title
5510	HILLINGDON
5540	HOUNSLOW
5570	ISLINGTON
5600	KENSINGTON AND CHELSEA
5630	KINGSTON UPON THAMES
5660	LAMBETH
5690	LEWISHAM
5720	MERTON
5750	NEWHAM
5780	REDBRIDGE
5810	RICHMOND UPON THAMES
5840	SOUTHWARK
5870	SUTTON
5900	TOWER HAMLETS
5930	WALTHAM FOREST
5960	WANDSWORTH
5990	CITY OF WESTMINSTER
6805	ANGLESEY
6810	CAERNARFONSHIRE AND MERIONETHSHIRE
6815	CARDIFF
6820	CARDIGANSHIRE
6825	CARMARTHENSHIRE
6830	DENBIGHSHIRE
6835	FLINTSHIRE
6840	MONMOUTHSHIRE
6845	PEMBROKESHIRE
6850	POWYS
6855	SWANSEA
6905	ABERCONWY AND COLWYN
6910	BLAENAU GWENT
6915	BRIDGEND
6920	CAERPHILLY
6925	MERTHYR TYDFIL
6930	NEATH AND PORT TALBOT
6935	NEWPORT
6940	RHONDDA CYNON TAFF
6945	TORFAEN
6950	VALE OF GLAMORGAN
6955	WREXHAM
7188	DOT (POLICY DIVISION) C FOX
7207	GOVERNMENT OFFICE (LONDON)
7212	TRAFFIC DIRECTOR FOR LONDON

Annex 2.4.1 Section Creation and Retirement Data**Introduction**

This annex describes the data requirements within HAPMS in order to support the Highways Agency's System for Management (SfM) Phase 2 Network Assets Solution.

Data Requirement

Within HAPMS the section data fields required for SfM are:

- Road, section label
- Start date
- End date
- Length
- Section Function
- Operational Area
- Permanent Lanes
- Single or Dual
- Environment
- Local Authority.

Sections Creation

For all sections created the following data are also required:

1. Creation Type

Creation Type is to be selected from the following:

- **New Build.** For all section creations resulting from a construction or improvement scheme. This includes modified sections – e.g. where they are widened or lengthened.
- **Trunking.** When the section addition results from a local authority road being brought into the Highways Agency's ownership.
- **Re-referencing.** The new section has been created solely due to re-referencing – this is most common following a road number change.
- **Data Cleansing.** When a section is 'found' i.e. the section has been in existence and under the control of Highways Agency but has not previously been recorded.

2. PIN (Project Number)

All "New Build" sections require the PIN field to be populated with the PIN of the project that created that section.

3. Traffic Accumulation Date

The Traffic Accumulation Date should be set to the date of last major strengthening or the date of original construction if no major strengthening has since been carried out.

Retired Sections

For all sections retired the following data are also required:

1 Retirement Type

Retirement Type is to be selected from the following:

- **Demolition.** For all section retirements resulting from a construction scheme, e.g. an existing pavement section is demolished as part of a bypass scheme.
- **Detrunking.** When the section retirement results from the section being transferred to local authority management.
- **Re-referencing.** The section has been retired solely due to re-referencing – this is most common following a road number change.
- **Data Cleansing.** This type should be selected when a section is retired due to the fact that it should not be recorded as a section e.g. a single physical section has been recorded twice.

2 PIN (Project Number)

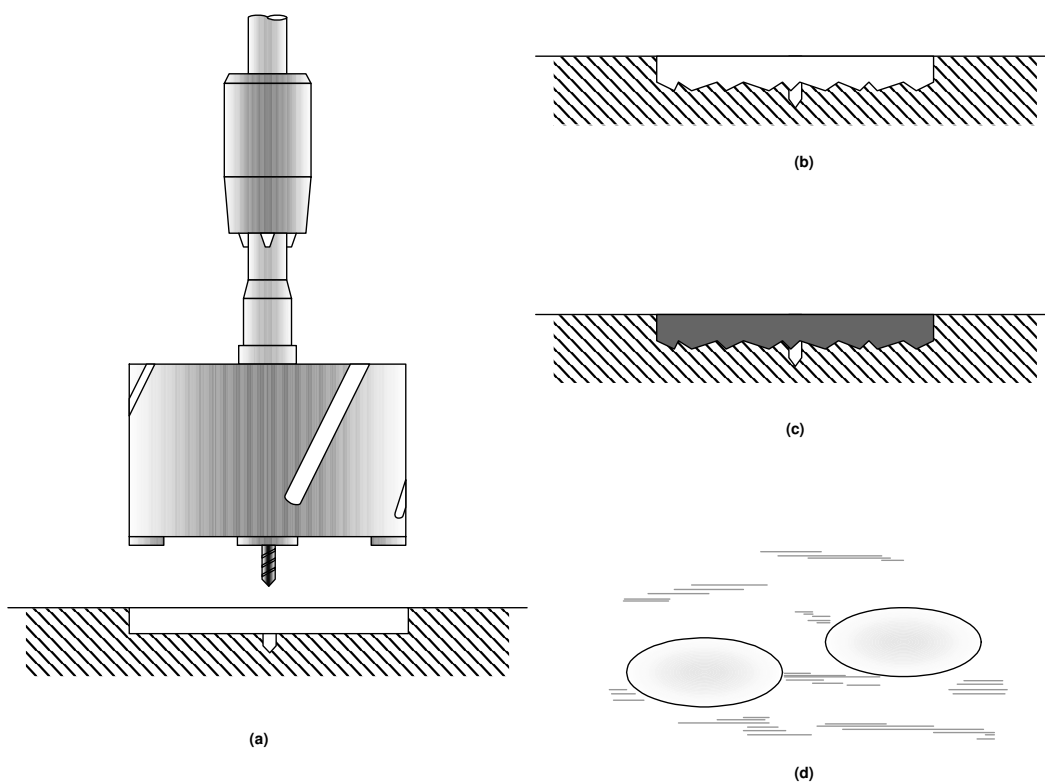
All “Demolition” sections require the PIN field to be populated.

N.B. Within HAPMS, the above Creation and Retirement data can vary by chainage within a section.

Annex 2.4.2 Method of Installation of Section Reference Markers

Extract from patent number GB2179385B

A pocket is formed in the road surface by a drilling technique. A drill is used comprising a central pilot bit surrounded by an annular bit. The pilot bit permits drilling of an annulus by the annular bit in a precise location by guiding the annular bit. The annulus has an outer diameter of approximately 100mm and a depth of between 5 and 15mm. An annular recess is formed in the road surface and a pocket is filled with a heated fluid thermoplastic material to the uppermost edge of the pocket and the material allowed to cool and set to form a stud. The jagged base of the pocket keys the stud in the pocket. The stud projects slightly above the top of the pocket, the amount of the projection being determined by the surface tension of the fluid material during the forming of the stud. See (a) to (d) below.



- (a) Drilling of pocket
 (b) Annular recess formed by drilling
 (c) Filling of pocket with thermoplastic
 (d) Finished Section Reference Markers (or Studs)

Figure 2.4.2: Method of Installation of Section Reference Markers

Annex 2.5.1 Typical use of on-carriageway XSPs and layouts for Section Node Reference Markers

These notes apply to all Figures in this Annex

1. On dual carriageways, section reference markers must be positioned in the centre of the wheeltracks of the left hand lane.
2. On single carriageways section reference markers must be positioned in the centre of the wheeltracks in the left hand lane in both directions.
3. Section reference markers must be installed at staggered crossroads as if it is two separate 'T' junctions.
4. The cored thermoplastic markers must be installed on a line perpendicular to the nearside kerb, edge line or projected kerb line passing through the notional position of the end of the sections(s). Markers must be installed clear of all carriageway markings.

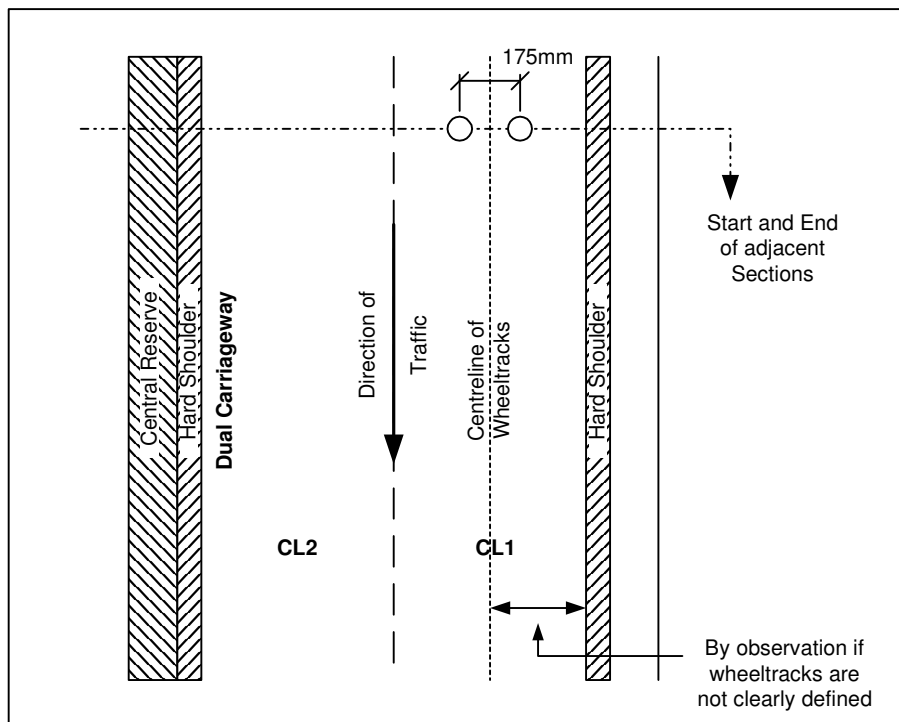


Figure A2.5.1 Position of Markers of Two Lane Dual Carriageway

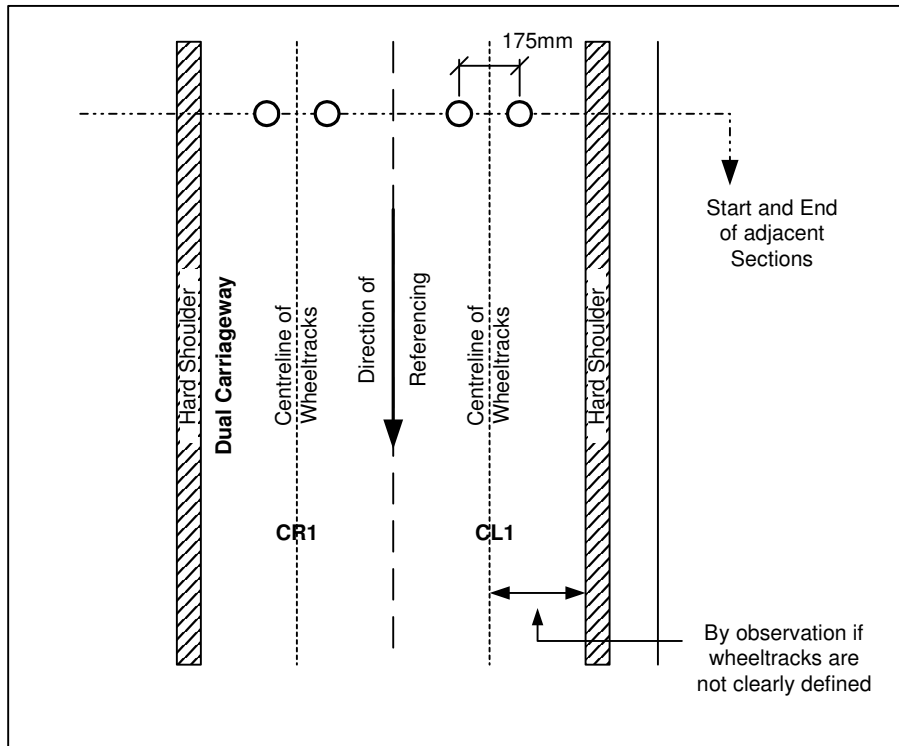


Figure A2.5.2 Position of Markers on Two Way Single Carriageway

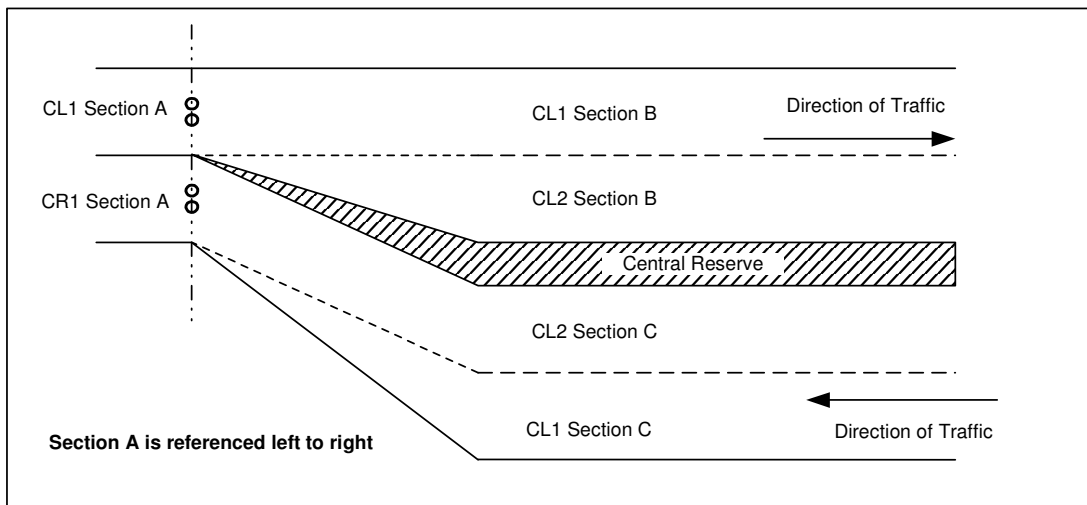


Figure A2.5.3 Start of Dual Carriageway

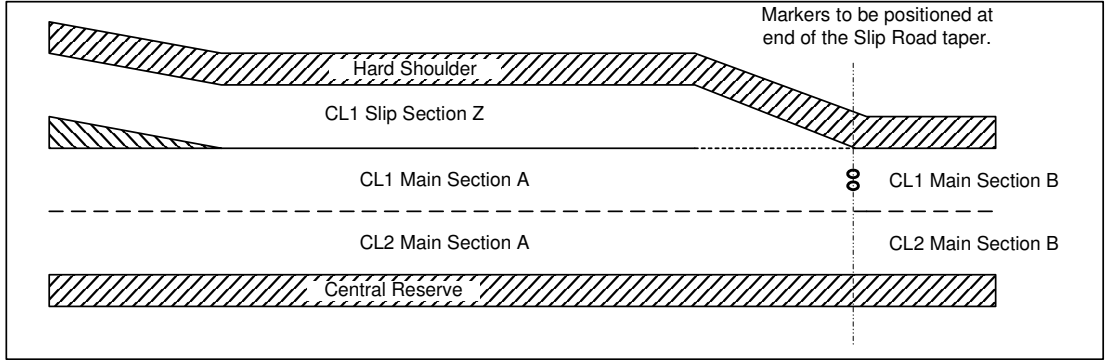


Figure A2.5.4 Slip Road entering Main Carriageway

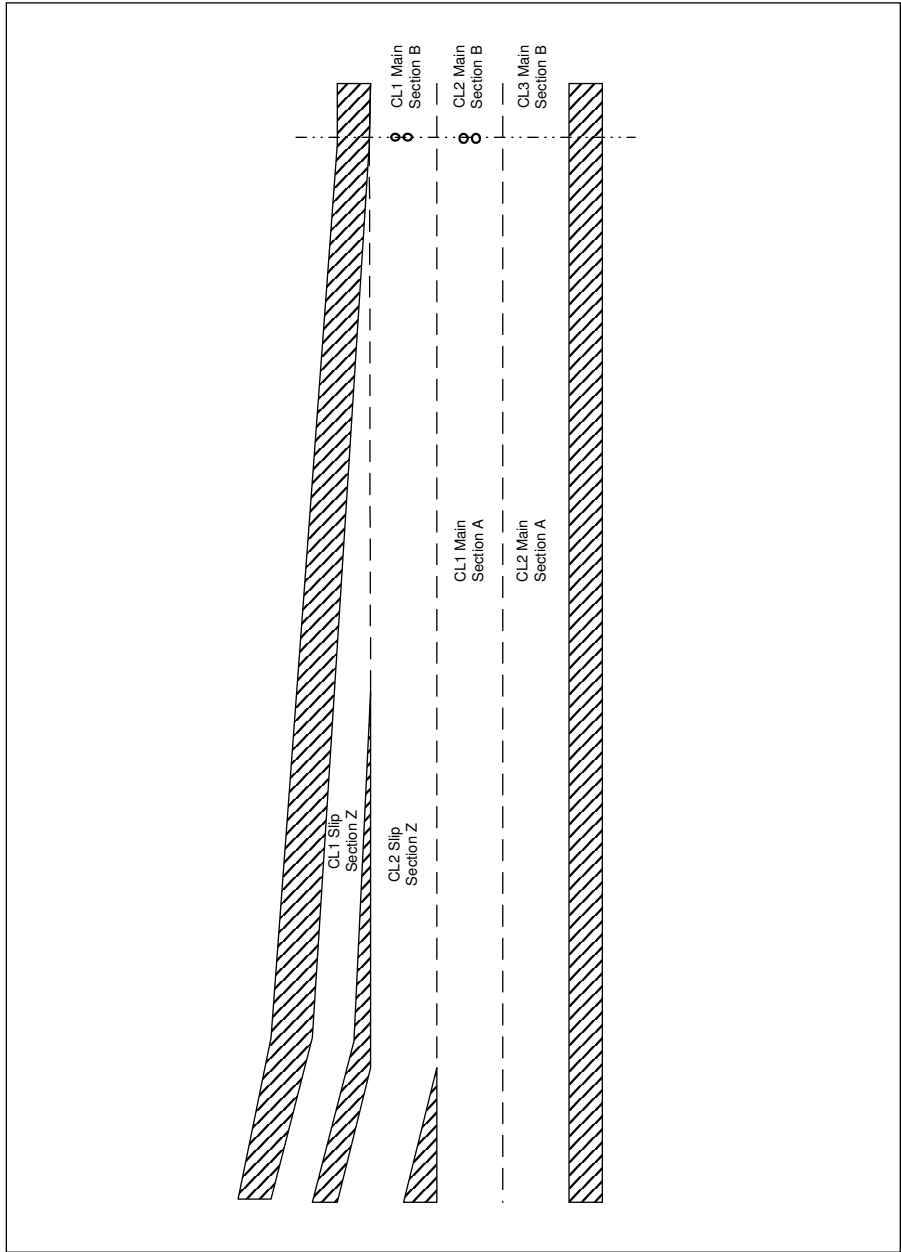


Figure A2.5.5 Main Line Addition at a Ghost Island Merge

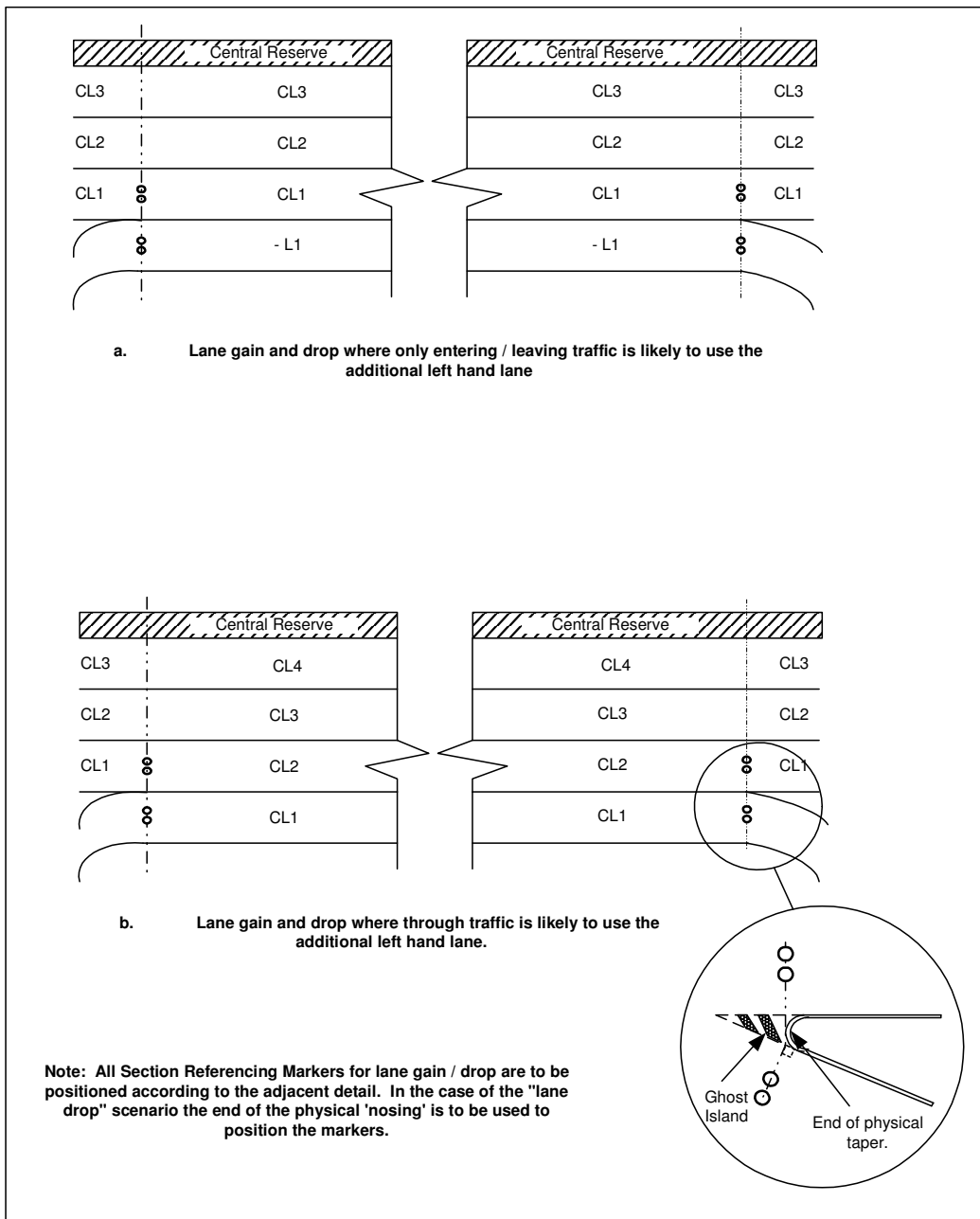


Figure A2.5.6 Lane Gain and Drop

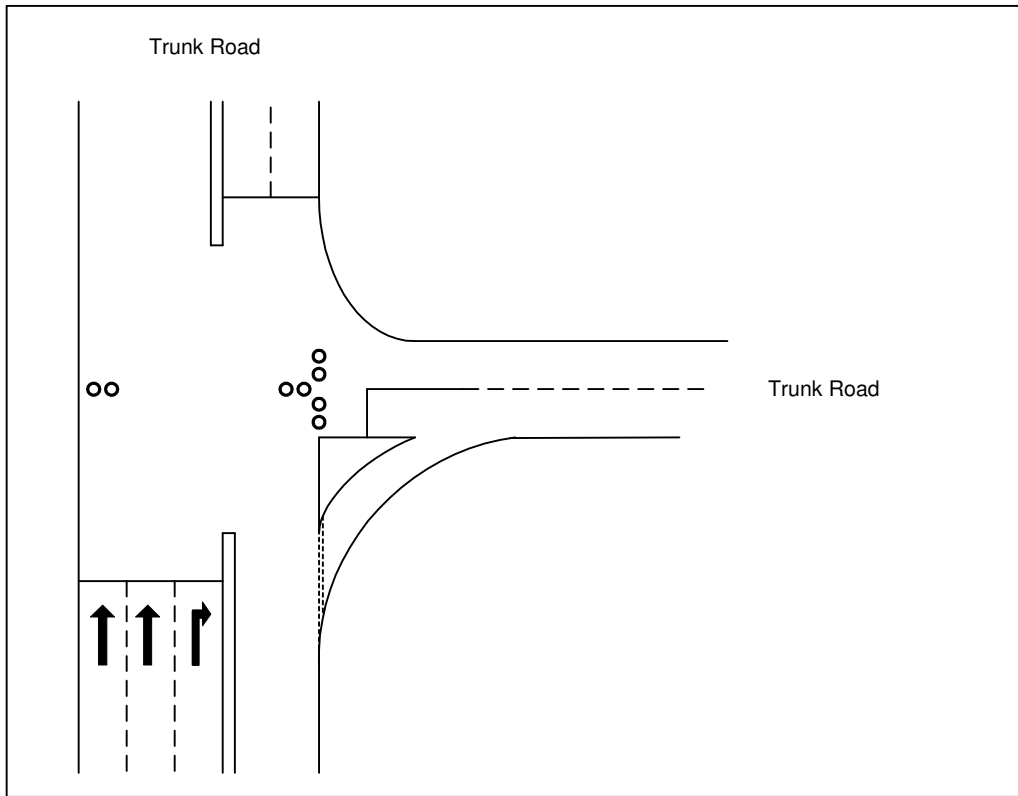


Figure A2.5.7 Trunk Roads meeting at a 'T' Junction

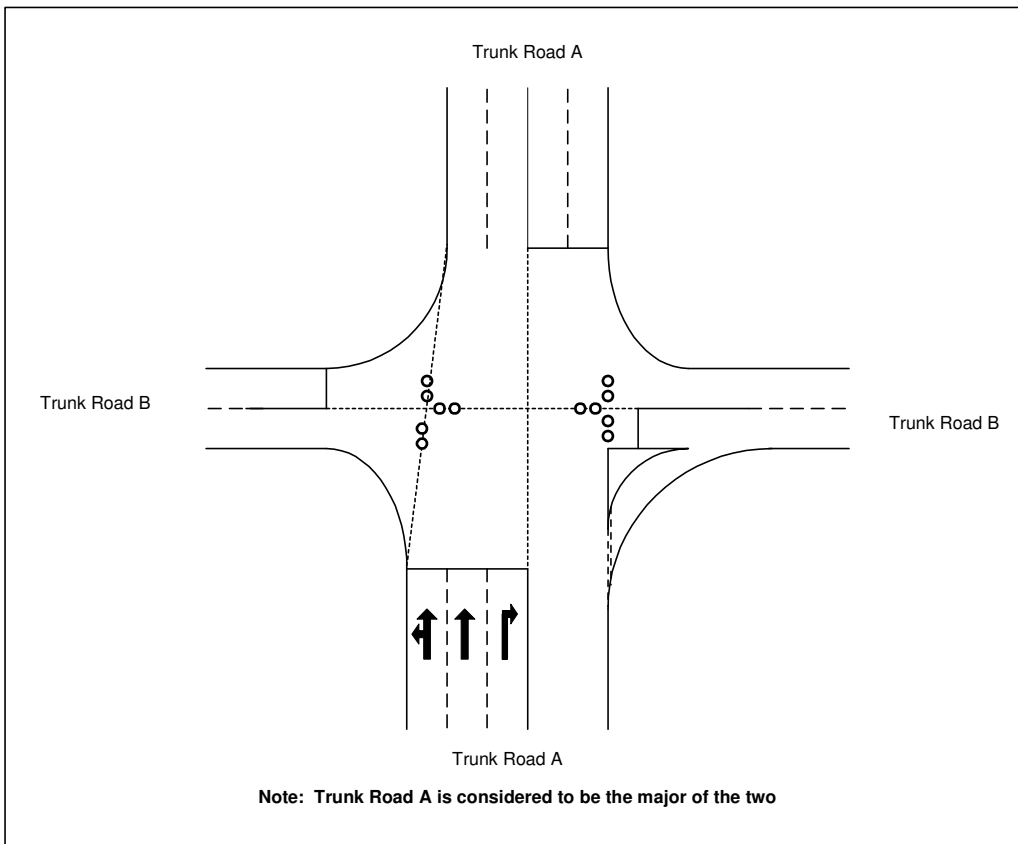


Figure A2.5.8 Trunk Roads meeting at a Cross Roads

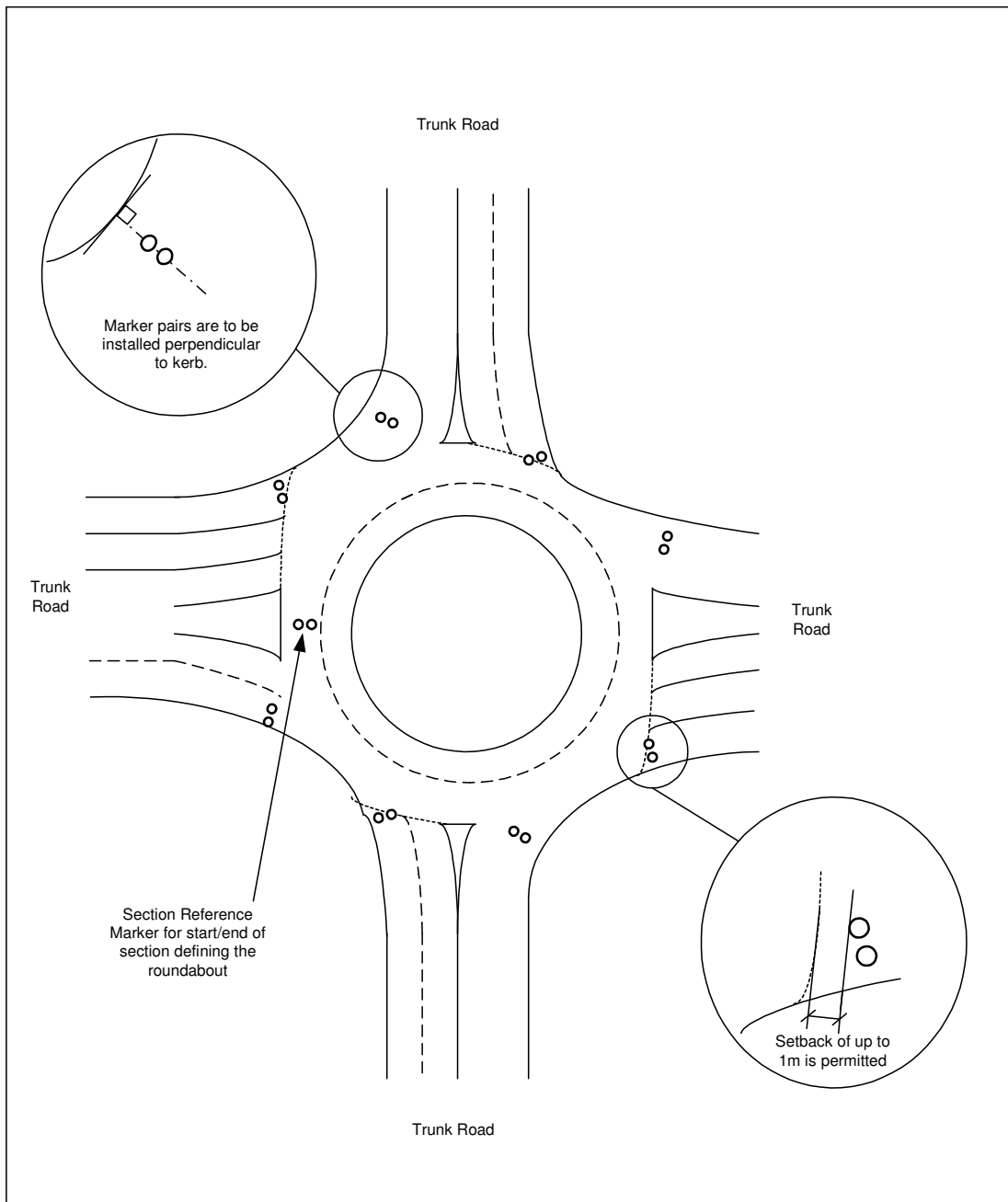


Figure A2.5.9 Trunk Roads meeting at a Roundabout

PART 11 – ADMINISTRATION

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11.1 Claims for Damage to the Highways Agency's Road Network [Green Claims]**11.1.1 Introduction**

The Highways Agency's Green Claims team is responsible for pursuing those person/s responsible for causing damage to the Highways Agency's road furniture. This function is performed in conjunction with Service Providers.

Performance targets for each of the Service Providers are in place, within their respective contracts, to monitor both performance and revenue.

Service Providers fall into the following categories:

- i) Maintaining Agents (MA)
- ii) Managing Agents (SMA)
- iii) Managing Agent Contracts (MAC)
- iv) Enhanced Managing Agent Contract (EMAC)

Each of these operates under differing procedures and these are detailed below.

11.1.2 Requirements for Maintaining Agents (MA)

Where the responsible party can be identified and the repair costs is under £2000 the MA is responsible or the recovery action.

Once the repair is completed and the final costs are known the MA must seek reimbursement from the responsible party and any monies recovered will belong to the Highways Agency.

For those cases where the responsible party is known and the repair costs exceed £2000 the MA must submit all claim details by way of a TR430 claim form to the Highways Agency. In these cases the Highways Agency's Green Claims team will pursue and retain the recovery of any monies.

In the case of damage where the repair cost is under £2000 and those responsible for the damage are unknown the MA must report these to the Highways Agency Green Claims team as a bulk return. This bulk return must detail dates, incident locations and a description of the damage and must be submitted at quarterly intervals throughout the financial year.

Where the repair costs exceed £2000 and those responsible for the damage are unknown the MA must submit these incidents using the TR430 claim form to the Highways Agency's Green Claims team. These claims are written-off in line with the Highways Agency's accounting procedures.

11.1.3 Requirements for Managing Agents (SMA)

Where the responsible party can be identified and the repair cost is under £5000 the SMA is responsible for the recovery action.

Once the repair is completed and the final costs are known the SMA must seek reimbursement from the responsible party. Money recovered is paid to the Managing Agent and deposited into a special Bank Account on behalf of the Highways Agency. All monies recovered are the property of the Highways Agency.

For those cases where the responsible party is known and the repair costs exceed £5000 the SMA will submit all claim details by way of a TR430 claim form to the Highways Agency. In these cases the Highways Agency's Green Claims team will pursue and retain the recovery of any monies.

In the case of damage where the repair cost is under £2000 and those responsible for the damage are unknown the SMA must report these to the Highways Agency Green Claims team as a bulk return. This bulk return must detail dates, incident locations and a description of the damage and must be submitted at quarterly intervals throughout the financial year.

Where the repair costs exceed £2000 and those responsible for the damage are unknown the SMA must submit these incidents using the TR430 claim form to the Highways Agency's Green Claims team. These claims are written-off in line with the Highways Agency's accounting procedures.

11.1.4 Requirements for Managing Agent Contractor Contracts (MAC)

All incidents, where the repair costs are under the £5000 threshold, are the responsibility of the MAC Service Provider and dealt with at their own risk.

Where the responsible party can be identified, and once the repair is completed and the final costs are known, the MAC will pursue reimbursement and any monies recovered will belong to the MAC.

The MAC must bear the risk for all claims that fall under the £5000 threshold and where the responsible party cannot be identified.

For all cases where the repair costs exceed £5000 the MAC must submit all claim details by way of a TR430 claim form to the Highways Agency. In these cases the Highways Agency's Green Claims team will, where possible, pursue and retain the recovery of any monies.

11.1.5 Requirements for Enhanced Managing Agent Contractor Contracts (EMAC)

For all cases where the repair costs exceed £5000 the EMAC must submit all claim details by way of a TR430 claim form to the Highways Agency. In these cases the Highways Agency's Green Claims team will, where possible, pursue and retain the recovery of any monies.

Where the repair costs is below the £5000 threshold and those responsible for the damage are unknown the EMAC must submit these incidents using the TR430 claim form to the Highways Agency's Green Claims team. These claims are written-off in line with the Highways Agency's accounting procedures.

Where the responsible party can be identified and the repair cost is under £5000 the EMAC is responsible for the recovery action.

Once the repair is completed and the final costs are known the EMAC will request an invoice to be raised which will then be issued by the Highways Agency. Any monies recovered belong to the Highways Agency.

11.1.6 Exceptions

There are exceptions that apply to Maintaining Agents, Managing Maintaining Agents, Managing Agent Contracts and Enhanced Managing Agent Contracts.

Where a claim involves the following the Highways Agency reserves the right to automatically take over the claim processing irrespective of the claim value:

Fatality, serious injury, counterclaim anticipated, damage is not the responsibility of the Service Provider, theft (other than the vehicle), mining subsidence and incident involves the armed forces, NATO or other Government department

11.1.7 Claims for damage against persons unknown - bulk return

The following is an example of a bulk return form:

During the quarter ended the trunk road and motorway maintenance and lighting accounts have been debited with the following sums in respect of [no.] claims for damage estimated to cost £x,xxx or less for which it has not been possible to identify the persons responsible:-

Incident Number	Date of Damage	Locality of Damage	Description of damage	Gross cost of repair (inc. admin. fee) £
1				
2				
3				
etc				
				Total

Total [No.] cases where the cost of repairing the damage is more than £x,xxx (including administration fee) have been reported individually.

Chief Financial Officer/Principal Engineer

Signed.....Service Provider

Date.....

11.2 Claims Against the Highways Agency by Third Parties [Red Claims]**11.2.1 Red Claims**

Red Claims are defined as claims made by third parties against the Secretary of State arising out of the condition of the motorway & trunk road Area network. These claims are handled in the Highways Agency by the Third Party Claims Team (TPC). Case Officers in the Team are individually responsible for processing claims arising in their particular Highways Agency Area(s). Each Highways Agency Area will have one case officer assigned to it so it will be clear whom you need to contact initially on TPC issues. However, queries of a more general nature can be sent by e-mail to the Red Claims mailbox (REDCLAIMS_HAIL@highways.gsi.gov.uk), which is monitored on a regular basis.

11.2.2 Legal situation

Under the Highways (Miscellaneous Provisions) Act 1961, Highway Authorities have an obligation to maintain public highways to reasonable standards. The current provisions are incorporated in the Highways Act 1980, Section 41 (duty to maintain) and Section 58 (special defence in actions for damages for non-repair). The importance of Section 58 is that it provides the defence "that the Authority had taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which that action related was not dangerous for traffic". Effectively, this legislation requires Highway Authorities to categorise their networks in terms of location and usage, linking those categories to standards of inspection and maintenance. In Court, the interpretation of reasonableness is a matter for each individual case, but it is normal for judgments to take into account precedents from earlier cases.

Limitation Act – Under the Limitation Act 1980, a person has 3 years from the accident date to make a personal injury claim or 6 years in respect of a damage only incident.

From 26th April 1999 the new Civil Procedure Rules (otherwise known as the Woolf Reforms or the CPR) were introduced with the aim of speeding up pre-trial procedure and reducing the cost of litigation. Details of how to recognise and deal with a Protocol Claim for Personal Injury are detailed in the following heading.

Service providers are required to send TPC a completed report of the incident and supporting information within the timescale detailed in their contracts.

11.2.3 Process

Protocol Claims for Personal Injury – A Protocol letter can be recognised by its standard layout. It should include a clear summary of the facts on which the claim is based together with an indication of the nature of any injuries suffered and of any financial loss incurred. In cases of road traffic accidents, the letter should provide the name and address of the hospital where treatment has been obtained and the claimant's hospital reference number. The letter is submitted in duplicate and ends with the invitation to 'send the copy to your insurers'. It is advisable that, upon receipt of this letter, both copies are sent immediately by the Service Provider to TPC as the protocol states that an acknowledgement must be sent within 21 days. **Do not acknowledge the letter.** The Service Provider should, at this point, start to gather the supporting information required under their contract. Once TPC have acknowledged the claim, a decision on liability needs to be communicated within 90 days. In some cases, the claim will be passed to The Treasury Solicitor for advice and they might require further information from the Service Provider. Given the tight deadlines, any request must be dealt with promptly.

All other claims – TPC will use the supporting information supplied by the Service Provider to form an opinion of the claim. An acknowledgement letter will be sent by TPC informing the Claimant that

the Highways Agency is investigating their claim. It may be necessary for TPC to request further information from the Service Provider, which must be provided strictly within the timescale provided for in their contract.

Whenever a claim is received in TPC, the caseworker will send an e-mail to the Highways Agency Service Manager and the Service Provider for their records. The e-mail will give basic details of the incident and an estimated value of the claim.

11.2.4 Report

Form TR137/HA2 is the report form to be filled in by the Service Provider. This report form is an essential part of the decision making process and must be completed as fully as possible. It is essential that Service Providers maintain and retain accurate and detailed records of inspections, complaints received, incidents, work undertaken and the decisions why or why not to undertake work on the network as these may be called in evidence, often quite some time after the incident giving rise to the claim. The documents should provide a history for the location and an audit trail of the actions taken and reasons for them at all stages.

At various stages during the processing of a claim it may be necessary to seek further information from the Service Manager and Service Provider. In certain cases we may require witness statements from Safety Inspectors, and Maintenance Crew or others.

11.2.5 Decision

Once the claim has been decided and finalised with the claimant another e-mail will be sent to notify the Highways Agency Service Manager and Service Provider of the outcome. Our decision will be based on the facts and law, and will always reflect what we believe to be the attitude of the courts. For example, if we believe the courts would reject a claim, we will do the same. If, on the other hand, we believe that the courts would award compensation, we will offer to settle the claim. Should we believe an incident relates to the Service Provider's risks under their agreement with the Highways Agency, every effort will be made to secure an indemnity from the Service Provider including issuing legal proceedings if necessary – particularly if, earlier in the process, the Service Provider has refused to take over conduct of the case when invited to do so. Further information regarding indemnity provisions can be found in the appropriate section of the Service Provider's contract with the Highways Agency.

To aid us in our decision we may use The Treasury Solicitor, Department for Transport Legal Branch, Transport Research Laboratory, Valuation Office and other specialist advisors.

11.3 Standards Improvement System (formerly Quality Control Reporting System)**11.3.1 Service Provider's Duties and Responsibilities**

The Standards Improvement System (SIS) [formerly Quality Control Reporting System (QCRS)] is a method of reporting defects to perform or problems in the design, construction, supervision and maintenance of the trunk road network. Its use is **mandatory** for Service Providers.

SIS is a computerised database of reports generated from defects of specifications and design standards and other observations on these documents. The database records potential improvements using lists of components, symptoms, diagnoses, and detailed descriptions

SIS is operated and maintained by the Highways Agency. Its prime objective is to improve the performance of the engineering standards and specifications published by the Highways Agency, both independently and jointly with other organisations, however it can also be used to report defects or omissions in the international or national standards.

The SIS is also an early warning system to keep the Department abreast of any developing problems with its procedures, standards, specifications and advice. The information submitted on the SIS will not necessarily be 100% factual but it will represent the best 'estimates' of the underlying problems and their cost, that are available at the time of reporting.

11.3.2 Operation of the SIS

The SIS is fully described in HD34 and is the successor to the QCRS, which has undergone a radical review following lengthy consultation with users of the system. The new system is designed to be user-friendly and will be accessible by Service Providers over the internet. Any requests for help in using SIS, including requests for access for new users, should be directed to the Highways Agency Service Direct helpdesk in Leeds (0113 254 1140). The Standard was published in November 2003 with effective implementation from the date of publication. This document defines the Department's concept of a defect and provides guidance on reporting and standard input codes.

The SIS will not require additional inspections. There are sufficient inspections already established for the purpose of monitoring the network. However, the SIS will require defects or problems to perform as defined in HD34 to be reported.

The SIS is designed such that a report is automatically sent to the SSR technical adviser identified as dealing with the subject, he/she will be expected to provide feedback to the author of the report on an ongoing basis, and close out the report.

11.3.3 Additional Inspections

In some cases it may be necessary for an additional inspection to be made before an underlying problem can be assessed. If such an inspection is necessary, it will be reimbursed on an at-cost basis in line with additional inspections as defined and used in the RMMS.

11.3.4 Timescale

The SIS also acts as an early warning system. It is therefore necessary that reports be made on the SIS within a short timescale of the original observation. Owing to the diverse nature of the reports that will be received and the varying scale of the problems encountered, it is not possible to

give a categoric timescale, however, the period between the observation of a defect or problem and a report being made on the SIS should be no more than **four weeks** in most cases.

It is important to note that the Highways Agency is content that the preliminary diagnosis of the failure/problem to be the best intelligent guess only. Naturally, the more accurate the information is, the better the database will be, but reports should not be delayed waiting for follow-up analysis to take place. If, subsequently, the diagnosis or cost estimate needs to be changed then this is possible

11.4 IT & Systems

11.4.1 Introduction

The section covers the role of information systems in meeting the information requirements of the Highways Agency. The information requirements are guided by The Highways Agency's Information Strategy which sets out the vision for making the best use of information assets as detailed in this Part 11.4. It is expected that the Service Provider will review its operations and its own plans for information to comply with the objectives as set out in the Information Strategy as updated or amended from time to time.

The Service Provider must ensure that all liaison concerning matters in this Part 11.4 is channelled through the Service Manager or his delegated Information and Communication Technology (ICT) liaison contacts (i.e. Highways Agency ICT specialists, see 11.4.5).

Information requirements have been divided into the following three broad groups:

- a) Information required by the Highways Agency for the purposes of managing and operating the strategic road network.
- b) Information required by the Highways Agency and the Service Provider demonstrating that outcomes and conditions of the contract are delivered.
- c) Information on contract administration required by the Service Provider to demonstrate that it has carried out its responsibilities in a professional and proper manner.

The Service Provider must provide those information systems not currently provided by the Service Manager. Depending on the information requirements and subject to agreement from the Service Manager, the Service Provider need not necessarily use all the Highways Agency systems outlined in this section.

The Service Provider must provide appropriate hardware and software to operate both its own systems and those Information Systems as provided by the Service Manager. During the course of the Service Provider contract, there will be a need for the Highways Agency or the Service Provider to introduce new systems to meet information requirements which have not currently been identified.

The following sections cover the method of access to systems before detailing the systems which the Service Provider will be expected to use.

11.4.2 Business Information Gateway

The purpose of installation of the Business Information Gateway ("the Gateway") is to ensure that the Service Provider can access the Highways Agency's systems (see Clause 11.4.11). There is also a requirement for the Service Manager or Highways Agency to have remote access to the Service Provider's systems and documents which are applicable for the delivery of the contract. This access may be achieved by way of the Gateway or by some other means agreed by the Service Manager.

The connection to the Highways Agency's Information Systems is provisioned under the Gateway which offers a suite of services, currently provided through the internet using a Virtual Private Network sponsored by the Highways Agency to which the Service Provider must subscribe.

The technology underlying the Gateway may be subject to change from time to time. Connection to, and continued membership of, the Gateway is dependent on the Service Provider complying fully with the technical and security requirements set out later in this section.

The Service Provider for contracts commencing from January 2007 onwards is responsible for securing and paying for their own connection to be made to the Gateway, taking into account the data volume and the number of their staff expected to make use of the link at any given time. Details of the current network technology including an application for access to the Highways Agency network are set out in the Highways Agency Business Network Architecture document which is available from the Service Manager or the Highways Agency Service Direct Team (see 11.4.6). This document contains a Technical Architecture Form which the Service Provider must submit to the Service Manager providing details about how the Service Provider intends to connect to the Gateway. The Service Manager, following advice from the Highways Agency ICT Specialist, is responsible for authorising a connection for the Service Provider.

The Service Provider will arrange and be responsible for suitable support and business continuity for the connection, details of which must be agreed with the Service Manager. The Service Provider is responsible for onward connections to any satellite or site office used for the purposes of this contract.

The connection point situated in the Service Provider's premises must be located in a secure room.

Any access required by the Service Manager to systems, data or applications hosted by the Service Provider must also be provided via the Gateway or by other remote access methods agreed by the Service Manager.

11.4.3 Service Provider Security and User Access Requirements

The Service Provider must ensure that all users of the Highways Agency's system(s) comply with the requirements set out in the documents comprising the Application for External Access which are available from either the Service Manager or the Highways Agency Service Direct Team (see 11.4.6).

The current Gateway technology includes the following requirements for use of the Highways Agency's systems:

- a) All Service Provider users are to be subject to the basic security check as defined in the documents comprising the Application for External Access.
- b) All users must obtain the approval of the Service Manager in order to access the system(s) by completing a formal application and review process as defined in the section under New Account Management.
- c) The Service Manager must issue named individual user accounts which are mandatory, and the sharing or transfer of these named individual user accounts is not permitted.
- d) The user account application process and security checks are subject to regular audits.

The Service Provider is responsible for determining any formal application and security clearance requirements to enable the Service Manager to access any systems they provide. The Service Provider's ICT liaison contact must inform the Service Manager of those requirements including timescales within one month of the contract possession date and within one month where changes or new approvals are to be made during the contract period.

The Highways Agency is a member of the Government Secure intranet (GSi), a general purpose electronic data communications service joining Government departments. The implementation of the GSi may be subject to change from time to time, but the Service Provider must agree security arrangements with the Service Manager so as not to adversely affect this GSi accreditation.

11.4.4 Software and Licences

The Service Provider must provide software licences required for office applications and access to web applications. Licences for all specialist Highways Agency systems, e.g., HAPMS, etc. will be provided by the Service Manager.

11.4.5 Relationship Management

The Service Manager and the Service Provider must both nominate an ICT liaison contact to determine and resolve ICT issues that may arise in operating shared systems and communication networks. The contact details must be confirmed with the Service Manager and updated as required.

Those ICT liaison contacts are responsible for ensuring that ICT key contact information is provided and maintained between the Highways Agency and the Service Provider. Regular review meetings will be held between both ICT liaison contacts to ensure that any ICT issues arising in the execution of the contract are addressed in a timely manner. The review meeting will be held to ensure that::

- the Service Provider has an effective process for the completion of new account applications
- the ICT service delivery requirements of the contract are being delivered on time and to budget (if funded by the Highways Agency),
- the technology and applications function in the agreed manner,
- there is sufficient collaboration to deliver the efficient use of technology to the benefit of both parties.
- both parties are aware of any technological changes and notified well in advance of future upgrades of common software used by both parties.

11.4.6 Service Desk

The Highways Agency will provide an ICT help/service desk facility known as Service Direct and will be available to assist all Service Provider's staff that have access to Highways Agency systems or applications and will enable the Service Provider to report problems and record requests. Contact details for Service Direct are available from the Service Manager.

The Service Provider's ICT liaison contact must provide up-to-date contact details (i.e. daytime/out of hours/e-mail etc) to the Service Managers ICT liaison contact should contact be required to resolve issues affecting Service Manager's users of Service Provider's systems. These details must be copied by email to Service Direct.

As soon as Service Direct becomes aware of a Highways Agency system problem or issue, it will provide a target response time in accordance with the Service Direct service level agreement with the Highways Agency in effect at the time until the service level is restored or a suitable alternative arrangement has been reached. Urgent queries must be raised by telephoning Service Direct. Service Direct is currently available from 07.00 hours to 19.00 hours, seven days a week, 365 days of the year. Outside these hours an answer-phone is available to leave messages. The Service Provider will be notified of any changes of service during the contract period.

Non-urgent or out of hours incidents / requests can be advised by e-mail. The e-mail address is servicedirect@highways.gsi.gov.uk

If the problem cannot be resolved within the target response time or there will be a major impact on the Service Provider's service delivery then the Service Provider must inform the Service Manager without delay.

11.4.7 New Account Management

The Service Provider must nominate an account liaison officer to manage ICT user accounts and any issues arising thereof. Details of the Service Provider's liaison officer will be confirmed between the Service Provider and the Service Manager in accordance with the contract requirements and will be updated as required and copied to Service Direct.

Any Service Provider's staff wishing to have access to Highways Agency Information Systems must in the first instance contact the Service Provider's liaison officer who will liaise with the Service Manager. Under the current security and user access requirements the Service Manager will generate the necessary application forms and guidance notes through the Highways Agency's "New User Name System" (NUNS), or its successor, and will forward these forms to the Service Provider for completion and return as an application for a new account. Details of the process and any application forms may be obtained from the Service Manager.

For security reasons, the Service Provider must ensure that all new users must contact Service Direct personally for their personal password which will be issued verbally rather than by e-mail.

11.4.8 On-going Account Management

Requests for access to additional applications by the Service Provider who already has an existing Highways Agency's account must be requested through the *Service Manager* who must authorise access prior to processing by Service Direct.

11.4.9 Service Manager's access to Service Provider's applications

Service Manager's staff wishing to access any information systems or applications owned and hosted by the Service Provider for the purpose of delivering the contract must comply with the Service Provider's security and access requirements.

The Service Provider must advise the Service Manager of all access rights granted to the Service Manager's staff for the purpose of the contract.

11.4.10 Change Management

It will be the responsibility of the Service Manager's or the Service Provider's ICT liaison contact to inform the other as soon as either becomes aware of any matter or potential issue such as:

- Information system upgrade, change or termination
- Information system maintenance
- Change, or revision to data capture requirements
- Change or removal of access rights for Service Provider to access the *Highways Agency* information system, or *Service Manager's* access to *Service Provider's* information system
- Change to the Gateway, or
- Any other matter that could affect the Service Provider's performance.

A notice period for each system change must be agreed between the Service Manager and the Service Provider to enable both to comply with the requirements. Similarly the retirement of

applications and or the introduction of new ones will also be subject to an agreed period of notice to allow for completion of work and or re-training.

In emergency conditions or in the event of an unplanned system change, the Service Manager or the Service Provider will provide as much information as possible to the other concerning the change.

11.4.11 Specific Systems

The Service Provider must use or populate specific systems to support the information requirements of the Secretary of State, the Service Provider or contract management.

Service Provider's Systems to meet Highways Agency and Contract Management Information Requirements

The Service Provider must provide those systems as outlined in Table 1 to satisfy the information needs of the Highways Agency and to assist in the management of the contract.

Table 1		
Systems provided by the Service Provider required to meet Highways Agency and Contract Management Information Requirements		
System Required	Description	Reference
Works Order System	It is expected that the Service Provider's Works Order System will be interoperable with the RMMS	
Routine Maintenance Management System (RMMS)	Asset and defect database for all trunk road asset items	NMM Part 2
Environmental Database	System to be capable of supplying the requirements of the HA Environmental System as set out in DMRB Vol 10 Section 0	DMRB Vol 10 Section 0
Incident Support Unit (ISU) Data Capture System	System to enable the capture of ISU data and its transfer to the Department's Nominee.	NMM Part 7
Land Ownership System	Electronic management system for registered land ownership	Memorandum TR138 Notes on the Preparation of Land Plans and Reference Schedules
Accidents Database	Database of traffic accidents	NMM Part 2 (reported injury accidents)

Table 1		
Systems provided by the Service Provider required to meet Highways Agency and Contract Management Information Requirements		
System Required	Description	Reference
Electronic Document and Records Management	<p>The Service Provider shall operate a system for the management of electronic documents and records (including e-mails) which are created and maintained on behalf of the Highways Agency. Documents and records are defined in The Agency Records Policy, a copy of which can be obtained from the Service Manager.</p> <p>Service Providers, whose contracts commence from January 2008 onwards, shall seek agreement from the Agency Records Officer (ARO), through the Service Manager, on setting up a system for electronically managing both the electronic and physical records which they create and maintain on behalf of the Agency. This system is required for the capture, retention and disposal of all electronic or machine readable unstructured documents and records.</p> <p>Service Providers, whose contracts pre-date January 2008, shall submit details of their current document management system to the ARO, through the Service Manager, who will accept or otherwise indicate, where necessary, the changes (with associated timescales) required to meet the information needs of the Highways Agency.</p> <p>In seeking acceptance from the ARO Service Providers shall undertake the following:</p> <ul style="list-style-type: none"> • The Service Provider must submit details of the system (including a functional file plan and metadata standards) to the Service Manager within 3 months of the contract <i>possession date (or commencement date)</i> or, for existing contracts, within 3 months from receipt of this version of the Network Management Manual. The ARO, through the Service Manager, shall accept or otherwise assist in the development of the system to meet the needs of the Highways Agency. • In setting up the system, the Service Provider is responsible for ensuring that the system is compliant with the relevant standards and codes of practice on records management and legal admissibility. The Service Provider must submit a record management proposal to be agreed with the ARO. The ARO is responsible for providing record management policy and advice that meets the needs of the Highways Agency while complying with statutory regulations. Current standards and codes of practice include the following: <ul style="list-style-type: none"> ○ BSI BIP 0008:2004 - Code of Practice for Legal Admissibility and evidential weight of information stored electronically. ○ BS ISO 15489-1:2001 Information and documentation. Records management. General 	

Table 1		
Systems provided by the Service Provider required to meet Highways Agency and Contract Management Information Requirements		
System Required	Description	Reference
	<ul style="list-style-type: none"> ○ Code of Practice on the management of records, under s.46 of the Freedom of Information Act 2000 ○ BSI 0012 - BSI Data Protection Guide • The Service Provider must ensure that the system permits the transfer of documents and records back to the Highways Agency or to another Service Provider in a manner which has been agreed with the ARO. <p>The Service Provider shall incorporate the accepted system into their quality management system to be available for use from the contract <i>possession date (or commencement date)</i> or, for existing contracts, from the date specified by the Service Manager. The Service Provider is encouraged to ensure that the details of the system will be dynamic, which will require discussion and development with the Service Manager and the ARO.</p>	

Service Provider's Systems to fulfil their own business information requirements and effective delivery of the contract

Table 2 provides some examples of information systems which Highways Agency expects the Service Provider to provide and operate in order to fulfil the requirements of the Service Provider's business and to provide effective delivery of the contract. They are not prescriptive nor exhaustive.

Table 2	
Examples of Information Systems as provided by the Service Provider to fulfil the requirements of the Service Provider's own business and effective delivery of the contract	
System	Comment
Quality Management System	The Service Provider will implement an effective quality management system which will ensure consistency and improvement of working practices. The Service Provider should aim to align their system either to meet or to be better than the required quality standard as set out in the contract.
Collaboration System	The Service Provider will exploit collaboration technologies between its supply chain partners in order to deliver a continually improved service to the Highways Agency.
Change Control System	This system will manage changes to process and systems

Table 2	
Examples of Information Systems as provided by the Service Provider to fulfil the requirements of the Service Provider's own business and effective delivery of the contract	
System	Comment
Customer Relationship Management (CRM) System	This system will manage the CRM strategy to ensure long lasting relationships with the Service Provider's/Highways Agency's customers. The system will seek to improve customer service by performing functions such as identifying what customers value the most and providing an effective mechanism to handle problems and complaints. The system is expected to align with the visions of the Highways Agency Information Strategy.
Human Resource Management System	The Service Provider will utilise this system to manage issues such as recruitment, skillsets, employee history, payroll, etc.
Facilities Management System	The Service Provider will use a system to ensure that the Service Provider's office estate is managed effectively and efficiently to provide Service Provider staff with a safe, healthy and secure environment.
Financial Management System	The Service Provider will use a system to produce timely in-year and year-end management and accounting information.
Project Management System	The Service Provider will use a system to assist in the planning and organisation of activities in order to meet the Service Provider's programme for effective delivery of Highways Agency projects.

Highways Agency Information Systems for effective delivery of Contract Management

The Service Provider must use or populate the systems listed in Table 3 which are provided by the Highways Agency.

The Service Provider is required to collect and maintain the information relevant to the contract using either direct entry into the HA's information systems or by an agreed interface with the Service Provider's own information systems.

If the Service Provider provides their own IT information system(s), the Service Provider must ensure that the system is able to store all the data required to populate the HA's information systems accurately and comprehensively. The Service Provider is responsible for uploading the data electronically via an interfacing mechanism which has previously been agreed by the Service Manager or his ICT liaison contact. The Service Provider is responsible for checking the accuracy of the data and correct any incorrect data prior to uploading them to the HA's information systems. The Service Provider must upload the data to the HA's information systems at a frequency as specified in the inventory data management of the Routine & Winter Service Code, in the requirements for each HA system or as agreed with the Service Manager.

Table 3		
Systems provided by Highways Agency required to meet the Contract Management Information Requirements		
Current HA System	Description	Reference
Highways Agency Traffic Information System (HATRIS)	Stores historical traffic flow and journey time/speed data collected on the motorway and all-purpose trunk road network. HATRIS currently contains two distinct databases: 1. TRADS (Traffic Flow Database System). This contains hourly count data from inductive loops at approximately 1000 locations across the HA network. 2. JTDB (Journey Time Database). This contains average speeds and total flow for each 15 minute period throughout the year for each junction to junction link on the HA core network. Journey speed data is currently taken from four sources - MIDAS, NTCC and Trafficmaster ANPR cameras, and ITIS GPS vehicles.	Stand alone system
Area Performance Indicators (API)	An internet hosted and centrally populated Performance Management information system	Stand alone system
“Motivating Success” - A toolkit for Performance Measurement a. maintenance b. major projects	System to measure performance of a. maintenance contracts or b. major construction projects.	Procurement Supply Chain Management
Accident Incident Reporting System (AIRS)	The AIRS incident reporting system allows the completion of a single incident report, which can be submitted to several organisations	Stand alone system
Highways Agency Pavement Management System (HAPMS)	HAPMS consists of a set of computer applications that provide the following business capabilities: <ul style="list-style-type: none">• Improved data management by holding network, construction, definitive inventory, traffic, accident (described in Chapter 2.6.8) and condition data on a single database (the Network Data Repository)• Enhanced analysis and reporting of the data both in map-based and textual formats• Integrated tools for the optimisation, in terms of minimising whole life cost within the available budget, of pavement maintenance at both a scheme and network level• Recording and management of lane closure information	NMM Part 2 details all the applications available through HAPMS
Structures Management Information System (SMIS)	SMIS provides operational support to structures management throughout the lifecycle of the structure	BD 62/94, IAN 67/05 NMM Part 2

Table 3		
Systems provided by Highways Agency required to meet the Contract Management Information Requirements		
Current HA System	Description	Reference
Highways Agency Geotechnical Data Management System (HAGDMS)	Internet hosted and GIS based Geotechnical Inventory	NMM Part 2
Highways Agency Drainage Data Management System (HADDMS)	Shares the facilities developed for HAGDMS and exists on the same platform. This provides integrated geotechnical/drainage information	NMM Part 2
Project Appraisal Report (PAR)	Allows appraisal details of Local Network Management Schemes to be submitted to the Agency	NMM Part 10 CHE Memorandum 178/06
WebDAS	Database of departures from HA standards and aspects not covered by standards, including SHW specification departures.	NMM Part 0 CHE Memorandum 157/05 DMRB Vol1
Software for Whole-life Economic Evaluation of Pavements (SWEEP)	SWEEP is a module of HAPMS. It has facilities to provide whole life cost estimates and evaluations for a number of scheme options including a do nothing comparison	NMM Part 2
Highways Agency Traffic Management System (HATMS)	Motorway control and communications system	NMM Part 3
National Online Motorway Asset Database (NOMAD)	Holds details of all communication and other electrical equipment on the motorway network	Stand alone system
Cultural Heritage Database	Part of HAGIS. Database of Cultural Heritage items	Part of HAGDMS
Winter Maintenance Reporting System (WRF) ICECAST/ICELOG	Provides the Department's Nominee with information on the state of the network and weather related incidents.	NMM Part 5

Table 3		
Systems provided by Highways Agency required to meet the Contract Management Information Requirements		
Current HA System	Description	Reference
Electronic Service Delivery for Abnormal Loads (ESDAL)	All notices received pursuant to Schedule 9 of the Road Vehicles (Authorisation of Special Types) General Order 2003 and documentary evidence of advice given to operators & indemnities received from operators To provide an assisted route planning and automated notification system for the management of Abnormal Indivisible Loads (AILs) throughout Great Britain	NMM Part 6
HANET	Web based internet hosted system for viewing CCTV camera pictures	NMM Part 8
DevCon	Permits logging, processing, control and monitoring of all planning applications received within the HA, to ensure dealt with within the required timescales of planning applications There is a viewing layer available in HAGIS	Stand alone system
Streetworks – Electronic Transfer of Notices (ETON)	System for the posting of streetwork notices	NMM Part 6
Noise Assessment and Insulation System (NAIS)	GIS based tool for predicting noise impacts on the environment surrounding the trunk road network	Stand alone system
MAPPA	System to manage applications for motorway passes	NMM Part 6
HA PartnerNET	An internet collaboration site for the Agency & its partners.	NMM Part 10
NTCC Desktop Service	Desktop tool providing road performance information (flows, delays, accidents, planned and actual closures).	
System for Management (SfM)	The Agency's finance and accounting system which supports major business transaction processing requirements	
Highways Agency Management Information System (HAMIS)	Portal system providing access to HAGIS	
HAGIS	Stores information using the latest digital mapping, which allows users to view geographical data for a specific area of the UK by zooming in and out and using the built in GIS tools.	
Energy Procurement Strategy (EPS)	An ACCESS database containing details of lighting units on the road network and is used to determine energy consumption provided by the various energy suppliers. Refer: EPS National	

Table 3		
Systems provided by Highways Agency required to meet the Contract Management Information Requirements		
Current HA System	Description	Reference
inventory data	Unmetered Energy Contract Inventory Maintenance Procedures Notes for Providers in accordance with EPS National Unmetered Energy Contract Inventory Maintenance Procedures: Note: The EPS system is currently maintained by <i>Atkins Odlin</i> – a consultant firm working on behalf of the Highways Agency Contract Manager.	

11.5 Forecasting & Budget

11.5.1 System for Managing (SfM) – Introduction

The Highways Agency operates a “**System for Managing**” (SfM) using the suite of Oracle Financial programs and associated modules . The SfM project has introduced a number of Oracle based financial management systems to most aspects of the Highways Agency’s business. The Service Provider must submit invoices and accruals to the Highways Agency via a module of SfM known as Applications and Certificates (or “Apps and Certs”). Full user training will be provided by the Highways Agency.

11.5.2 Applications and Certificates Overview

The Applications and Certificates system is an Oracle based module that was implemented in 2002/03. Access to the Apps & Certs module will be provided with a remote link from the Highways Agency’s IT network to the Service Provider’s office. It is a fully integrated system providing the following functions:

- Submission of Managed Works certificates (CONH501).
- Electronic submission of all Service Provider invoices.
- Entering of Manual Accruals at each month end.

The Apps & Certs system works on a cumulative basis and accounting detail is captured down to project (and task) level. It is a pre-requisite to have the following in place in order to use the Apps & Certs module:

- **Approved Blanket Purchase Agreement (BPA)** – to be set up and maintained by the Highways Agency. The value will be equal to the amount of secure funding held against a contract typically year by year.

- **Approved Requisition which becomes a Release.** The Service Provider must create requisitions for each project allocating use of funds within the BPA. Any requisition under £5m will automatically approve, as long as the sum of all requisitions to date stays within the BPA total. Any requisition over £5m will require the (electronic) approval of the Service Manager.

Once in place the Service Provider can, in the case of Managed Works, enter applications on behalf of a contractor and convert these into a certificate for submission to the Highways Agency. A certificate cannot be certified if it exceeds the value of an approved release. The submission of an invoice from the Service Provider will not require an application, but will begin life as a certificate and follow the same process from then on.

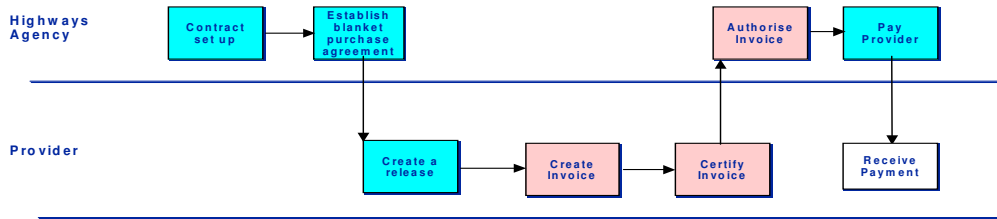
11.5.3 Service Provider use of Apps. & Certs. System

The Service Provider must use the Highways Agency's Apps. & Certs. system to enter and forward both a) their own invoices, and b) any Applications for payment received from contractors they may be managing. Invoices or applications submitted by any other method will not be paid.

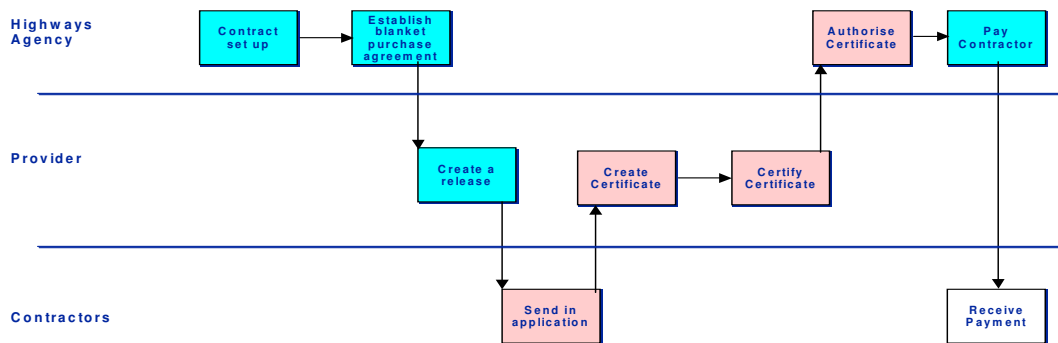
A paper copy of either the invoice or certificate and supporting documentation must be submitted to the Service Manager and Highways Agency Payment Team at the same time as the invoice/certificate is certified on Apps and Certs. The paper copy must be stamped with the following wording "FOR FILING ONLY. DO NOT REGISTER - PROCESSED THROUGH APPS & CERTS". (A stamp with this wording can be provided by Highways Agency).

The two flow diagrams below outline the steps taken by each party in the payment process.

Payments for Providers costs



Payment for contractors billing via applications



11.5.4 Manual Accruals

The Service Provider must enter a Work in Progress accrual onto Oracle at month end (by a date to be instructed by the Highways Agency) that will represent the value of work carried out by themselves and, in the case of managed works the contractor, at the end of the month for each project, which has not previously been included in any invoice/certificate.

11.5.5 Oracle Project Accounting (OPA) Overview

A module of SfM - 'Oracle Project Accounting' is used to manage, collate and report Programme and Project Management information. It holds project related data such as expenditure and outputs.

The Service Provider must use OPA and 'Budget Wizard' to:

- Create new Project Identification Numbers (PINs). Associated with this is the need to use a different system – Highways Agency Information System ('HAMIS') - to create a conception stage PAR (Project Appraisal Report) for relevant PINs.
- Keep project related forecasts (£, outputs) up to date and synchronised with the Highways Agency required timescales, particularly in respect of the Monthly Management Accounts (MMA) cycle.
- Claim actual outputs when achieved.

Access to OPA is gained via the web and is governed by Highways Agency security arrangements.

Training will be given before access is allowed. The Service Provider is required to provide a schedule of names of people who will require access via each role.

11.5.6 Project Event Information

The Service Provider must record Project Event Information in accordance with the requirements of the Service Manager.

11.6 Road Safety Data Types & their Uses

11.6.1 Introduction

The chapter instructs Service Providers on the conditions associated with using any statistical accident data that is not sourced from the aggregate National Statistics issued annually by the DfT.

Specifically, the requirement is to ensure that whenever statistical information is used it is not possible to misinterpret or misrepresent unvalidated, provisional or operational as validated National Aggregate data. Definitions of these terms is provided in Part 11.6.3.

It defines the main types of reports and documents that are produced which contain accident data and the appropriate data source to be used, in light of the recent relaxation in the DfT user license agreement.

The use of inter-urban congestion data, which is now National Statistics, is not covered by this chapter and will be the subject of separate guidance.

11.6.2 Background

In October 2007 Network Operations Group (NOG) and Safety, Standards and Research (SSR) issued advice on obtaining local accident and casualty data. The Accident and Casualty Data Capture Guidance (referenced in the [Safety Operational Folder](#) on PartnerNET) provided recommendations on how to secure alternative data sources needed in order to facilitate trend analysis utilising operational safety data. The recommendation made was for local accident and casualty data to be sourced from Casualty Reduction Partnerships (usually the police, emergency services and the Local Authority).

At that time the Highways Agency was in negotiation with DfT about gaining access to unvalidated quarterly STATS19 data sets. At the end of December 2007 DfT agreed to allow the Highways Agency access to the unvalidated data under a license.

DfT have agreed to make this quarterly unvalidated STATS19 data available on the strict proviso that it is used appropriately, mainly internally within the Highways Agency and that all documents using it contain a caveat (see 11.6.3.3) regarding the nature and completeness of it. A memorandum of understanding has been agreed with the DfT. If the Highways Agency does not uphold this agreement then access rights will be withdrawn and WILL NOT be reinstated. Individuals in breach of the licensing agreement are in breach of the Government Statistical Protocols on data access and release and may be held accountable.

11.6.3 Data Sets Information

There are three main types of data set, validated, unvalidated and provisional or operational data. It is important that the Highways Agency, with the support of its Service Providers, uses all the data available but it must be borne in mind that some data sets have limits as to their use.

Validated STATS19 data	
The aggregated statistics issued annually by DfT that have been fully validated through the Police, Local Processing Authorities, DfT and Transport Research Laboratory (TRL) processes.	
National Statistics protocols apply to the use of this data.	
Information on the protocols and release practises are available from www.statistics.gov.uk/about_ns/cop/default.asp or on the Office for National Statistics website at; www.ons.gov.uk/about-statistics/ns-standard/cop/protocols/index.html	
Unvalidated STATS19 data	
The quarterly unvalidated STATS19 data issued by DfT and available through the Analysis Reports System on HAMIS to licensed users.	
Provisional	Operational data
Locally sourced STATS19 data obtained via Service Providers that has been through Police / Local Processing Authority validation process or has been agreed by them but not validated by DfT.	Locally obtained information from any source within Highways Agency, i.e. Command and Control records.

11.6.3.1 Unvalidated STATS19 data

Licensed users within the Highways Agency have access to quarterly unvalidated STATS19 data which can be shared with others including Service Providers. Such data will normally be received and made available in accordance with the table below;

Quarter	Date Received	Available in HAMIS
Q1 and Q2	October	November
Q1 – Q3	Following January	Following February
Q1 – Q4	Following May	Following June

The upload of data to HAMIS does not occur until quarters 1 and 2 have been received, this is because Police forces are not required to submit their data on a prescriptive basis and may choose to not update their data monthly, bi-monthly or quarterly and may instead choose to submit only annual information.

Unvalidated STATS19 data is subject to change at any time during the year and at each submission point all previous quarters may be updated; consequently at each submission point both DfT and TRL undertake the same checks as if the data has not previously been submitted. This also means that as the year progresses the data becomes more reliable and accurate.

11.6.3.2 Use of Unvalidated STATS19 data

Although validated STATS19 data should be used wherever possible when more recent data is required for intelligence purposes, unvalidated, operational or provisional data should be used in the following order:

1. Unvalidated STATS19 data from DfT
2. Local operational / local STATS19 / last week data (sourced through Casualty Reduction Partnerships, Police etc)
3. Service Provider safety data (e.g. record of fatalities)

4. Any other data collected by the Highways Agency i.e. command and control.

Further guidance on validated, unvalidated and provisional or operational data can be obtained from the Service Manager.

Unvalidated STATS19 data must not be used to answer Ministerial Submission Units (MSUs) and Parliamentary Questions (PQ's) **at an aggregate level** or report achievement against the 2010 Public Service Agreement (PSA) casualty reduction target.

Similarly, unvalidated STATS19 data should not be routinely used to answer other external correspondence. If a HAIL enquiry or other correspondence quotes unvalidated data or refers to a period of time not covered by validated data, in the first instance the response must use validated data. Any secondary or supplementary response may then contain unvalidated, provisional or operational data provided a caveat, explained at 11.6.3.3 below, is included.

The matrix at Annex 11.6.3 should be referred to for guidance on the appropriate data set to use within documents.

11.6.3.3 Use of Caveats

When unvalidated, provisional or operational data has been used in the production of any document, a clear statement that highlights the nature of the data, gives a caveat that it has not been fully validated and consequently may be incomplete or inaccurate (e.g. accidents not included, reported late or casualty status changed) is required. The statement should also include an assessment of the likely completeness / quality of the data used.

Although an example caveat is provided below, it does not provide one single form of words to be reproduced in all cases because the exact wording will depend on the nature of the document and which data source or sources have been used. All statements should conform to the Highways Agency's protocols on the marking of documents and highlighting of sensitivities.

Example caveat statement;

The statistical accident data referred to in this document (or named sections) was not derived from the National validated accident statistics but was sourced from (*insert source*). As this data has not yet been validated by DfT it cannot be assumed to be a complete data set as it may be found to be incomplete or contain inaccuracies. The requirement for up to date information for (operational purposes, road safety audit) was a consideration in the decision to use this data and as it was sourced from (*insert source*) who (*insert collection method*) it is sufficiently robust to be used in this context.

11.6.4 Instruction

When producing documents or reports containing statistical accident data, Service Providers must continue to use validated STATS19 data as the initial source of data. When other data is used to support or supplement validated data they must provide a clear distinction between validated and unvalidated, provisional or operational data in the form of a caveat together with a statement regarding the completeness / quality of the data.

Annex 11.6.3 Road Safety Data usage Matrix

Validated data should be the first choice source of data for inclusion in any documents. The matrix below highlights documents where only validated data can ever be used (*) and those where unvalidated, provisional or operational data may be used (√).

	Data to be used will be indicated * validated only or √ unvalidated, provisional or operational acceptable	Validated STATS19 data	Unvalidated STATS19 data	Provisional or Operational data	Comments
Documents	Accidents on the Trunk Network Report	*			
	Annual Route Reports		√	√	Only validated data can be used for National Killed and Seriously Injured (KSI) targets
	Annual Safety Statement		√	√	Only validated data can be used for National KSI targets
	Annual State of the Network Report	*			
	Area Safety Action Plan		√	√	Only validated data can be used for National KSI targets
	Cluster site list		√	√	Produced for Highways Agency use
	Economic Assessment report		√	√	Unvalidated or provisional / operational data can be used to supplement the validated data
	Fatal accident investigation reports			√	Produced for Highways Agency use
	Geometric departures from standard		√	√	Unvalidated or provisional / operational data can be used to supplement the validated data
	Intelligence Products (ad hoc reports for regional priorities)		√	√	Unvalidated or provisional / operational data can be used to supplement the validated data
	Managing Agent Accident & Incident reports			√	Produced for Highways Agency use
	Managing Agent Consultation & Liaison reports			√	Produced for Highways Agency use
	Monthly Performance Report			√	Produced for Highways Agency use
	Non-technical Environmental Summary		√	√	Unvalidated or provisional / operational data can be used to supplement the validated data
Post Opening Project Evaluation (POPE)		√	√	Unvalidated or provisional / operational data can be used to supplement the validated data	

	Data to be used will be indicated * validated only or √ unvalidated, provisional or operational acceptable	Validated STATS19 data	Unvalidated STATS19 data	Provisional or Operational data	Comments
	Project Appraisal Reports			√	Unvalidated or provisional / operational data can be used to supplement the validated data
	Quarterly State of the Network Report		√		
	Road Safety Audit Reports (All stages & exceptions)			√	
	Safety studies			√	
	Strategic Assessment (Area)			√	
	Strategic Assessment (Regional)		√	√	
	Strategic Assessment (National)	*			
	Tactical Assessment (Area)			√	
	Tactical Assessment (Regional)		√	√	
	Tactical Assessment (National)	*			
	Watchman Reports			√	Produced for Highways Agency use

PART 10 – PROGRAMME PLANNING & SCHEME DEVELOPMENT

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10.1 Programme Development

10.1.1 Introduction

Programming Guidance confirms the processes to be followed for the identification, assembly and updating of quality programmes of work for maintenance and smaller schemes.

The development of Regional programmes of work is co-ordinated by the central TO Programme, Planning and Systems Team, following process detailed within the guidance issued within the Forward Planning Guidance (FPG) documents. It is based on delivering 10 Year Plan Targets/Objectives, meeting Ministerial and other commitments and adopting minimum whole life cost solutions according to affordability and network constraints.

The four stages of developing programmes of work are:

- Identifying potential projects – Identification by Area Teams in liaison with their Service Providers of potential projects to meet set objectives
- Review and prioritisation of projects (Area Level) – Assessment and review at Area level including Area Value Management
- Programme review, update and assembly (Regional Level) – RPPT's and Regional Panels review Area submissions and identify a prioritised regional programme for each MPML category to match the indicative allocations for the regions
- Monitor and review – Monitor programme and take necessary action to achieve the agreed outputs and resource consumption

Cascade is the system to be used for budgeting and forecasting, project expenditure and outputs.

Service Providers must submit Project Appraisal Reports (PAR) to the Service Manager electronically. PAR's for all LNMS and Technology Schemes will be stored on the TO shared Group Drive.

Value management is a key part of the process to develop suitably prioritised programmes of work, ensuring that the right projects are taken forward at the right time. Programme development, incorporating Value Management, is a continuous process with project/ programme forecasts reviewed and updated regularly.

10.1.2 Guidance Documentation

Detailed guidance is available on the Highways Agency Portal and PartnerNet. It includes the following information:

- The **Programme Objectives Guide, which now incorporates the Strategic Planning Guidance**, clarifies the outcomes required from the programme. The first half of the guidance outlines the strategic direction from the Highways Agency Board including network priorities, customer first priorities and the core planning assumptions gives strategic direction and clarifies priorities for the planning period;
- The **Business Planning Framework** contains the **Forward Planning Financial Framework**, which sets out the financial rules and requirements

- **Delivering Objectives** primarily contains the **Traffic Operations Programming Guidance**, which sets out procedures for the development and forecasting of the Maintenance and LNMS programmes;
- **The Value management** section contains the **Continuous Value Management Guides** for:
 - **Local Network Management Schemes**,
 - **The Regional Roads Programme** and
 - **The Structures Renewal Programme**.

10.2 Scheme Development**10.2.1 Introduction**

This section provides brief details on how Smaller Schemes (LNMS) and Technology Schemes should be developed.

10.2.2 Objectives of Schemes

Schemes should be developed taking account of the Guidance referred to in Chapter 10.1.

10.2.3 Technical Guidance Documents

Schemes must be designed and appraised in accordance with the relevant parts of the Highways Agency Technical Manuals, particularly:

- Area Management Memos (AMMs)
- Chief Highway Engineer (CHE) Memos
- Design Manual for Roads and Bridges (DMRB)
- Interim Advice Notes (IANs)
- Technology Guidance
- Other guidance not in formal Highways Agency systems
- Value Management Documents

The relevant parts will vary depending on the type of the scheme.

10.2.4 Scheme Appraisal

Schemes must be documented and appraised using the Project Appraisal Report (PAR). The latest version (currently Version 5) should be used. PARs must be produced at all key decision stages in the scheme's life. The PAR Guidance document provides extensive advice on completing and processing of PARs. The appraisal in PAR uses the Government's New Approach to Appraisal (NATA) and further guidance on many aspects of NATA can be found on DfT's Web based Transport Analysis Guidance site (WebTAG) at www.dft.gov.uk/webtag/.

Further guidance on appraisal can be obtained from the appropriate NetServ Specialists. General issues about PAR should be directed to the appropriate NetServ TAME (Traffic, Appraisal, Modelling and Economics) contact for the Area concerned.

The Traffic and Economics Community on the Highways Agency Portal provides links to many documents of interest to those involved in Scheme Appraisal and/or the PAR process.

10.2.5 Value Management

PAR 5 provides a Value Management (VM) Score for some scheme types. Schemes must be Value Managed in accordance with the March 2007 Value Management Guidance and February 2009 Interim Update (or successor document(s)) available on the Forward Planning Guidance Community.

Note that the February 2009 Interim Update provides a new scoring method for Accessibility / Disability Discrimination Act 2005 (DDA) schemes and a VM scoring adjustment method for other scheme types with significant benefits for disabled users.

The Forward Planning Guidance Community can be found :

- For Highways Agency staff : under 'Improving our Network' on the Highways Agency Portal
- For other users : on the Highways Agency's PartnerNET web site at <http://www.ha-partner.net.org.uk>

10.2.6 Post Opening Project Evaluation (POPE)

The Highways Agency is keen to learn from the outcomes of its projects. This involves the POPE process carried out by NetServ TAME's consultant. POPE principally involves the comparison of actual realised scheme effects against those forecast within the PAR. The results of POPE will for example enable the Highways Agency to see which types of scheme perform well, and will enable improvements to the design and appraisal processes. The PAR will therefore where possible describe the forecast impacts of the scheme in a way which facilitates comparisons with actual impacts.

10.3 Area Safety Action Plans

10.3.1 Introduction

The document template for the Area Safety Action Plans (ASAP) is intended to set down guidance on the type of document to be prepared by Service Providers, preferably at the start of their commission.

The benefits of producing and adhering to a good ASAP include:

- casualty reductions
- reduced repair and maintenance costs
- improved management efficiency
- identification of problems
- identification of strengths and weaknesses
- prioritised action plan
- improved links/communication with other stakeholders
- stronger position on legal issues
- facilitate proactive safety management
- facilitate better monitoring procedures
- consistency with HA Strategic Safety Action Plan, Safety Operational Folder and Route Management Strategies
- establish audit trail in meeting HA casualty reduction targets

10.3.2 Requirements

The ASAP must be drawn up by the Service Provider in consultation with the Highways Agency's Strategic Safety Action Plan Team and set out the key actions for the Network. Service Providers must report subsequent progress against the plan through their annual report to the Service Manager and copy it to the Strategic Safety Action Plan Coordinator.

To draw in and sign up all stakeholders to this document, its development should be initiated with a workshop attended by all stakeholders. Stakeholders may include bodies such as the HA, police, other /managing Agents, local health authorities, local highway authorities and consultants, user groups etc. They may also include non-safety professionals such as planning and maintenance staff.

When the first draft has been established there should be further consultation. When the document is finished, all parties should be invited to sign up to assisting/contributing to its deliveries.

10.3.3 Availability

The ASAP template document is available on the HA Portal site (also previously issued under CHE Memo No. 173/06). It is not intended to be prescriptive as to the precise contents of each section may differ from area to area. It is the responsibility of the Service Provider to ascertain what is appropriate for their Network.

10.3.4 STATS19 Accident Data

Additional un-validated STATS19 data and the statistics on personal injury road accidents, is now available on HAMIS in advance of the traditional validated data provided by DfT. Although the use of this new data is strictly controlled, see 11.6, it can help the Highways Agency with operational intelligence, in understanding emerging trends and may help inform the delivery of Area Safety Action Plans. Should Service Providers wish to understand what un-validated data is available and

how it could be used they should direct enquiries to the Highways Agency's Road Safety, Risk, Data Co-ordination and Analysis Team. They will also be able to advise how an application to access the data may be made.

PART 1 – MANAGEMENT OF HEALTH & SAFETY

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1.1 General Health and Safety

1.1.1 Introduction

The Network Management Manual encompasses the processes for the management of the motorways and all-purpose trunk road network for which the Highways Agency, who are the executive agency to the Department for Transport, are responsible. This includes the interface between the Highways Agency, the Service Provider and road users on the motorway and all-purpose trunk road network.

The Health and Safety at Work etc. Act 1974 and those regulations made under it provide the legal framework for occupational health and safety in network management. Due to the nature of the works in network management, the Construction (Design and Management) Regulations 2007 (CDM Regulations) are particularly relevant as they determine the roles and responsibilities of the client, principal contractor, CDM co-ordinator, etc.

Throughout the document there are several references to occupational health and safety, emphasising the need for it to be an integral part of the management and operational function. In order for that integration to be successful there has to be a clear understanding of the roles and responsibilities of the various parties. This chapter provides a summary of the key issues that duty holders (Highways Agency and Service Provider) must consider in order to comply with health and safety legislation.

1.2 Main Legislation relating to Network Management

This section deals with many of the legislative Acts and Regulations that are considered important and relevant to the work of the Highways Agency and the Service Provider undertaking or involved in any of the tasks and activities described in the Network Management Manual. They act as a prompt for the Highways Agency and the Service Provider in ensuring that they are fully aware of the existence and main requirements of each Act or Regulation.

1.2.1 Management of Health and Safety at Work Regulations

The Management of Health and Safety at Work Regulations and its associated approved code of practice introduced the need to ensure that health and safety is managed effectively, taking into regard the size and complexity of an organisation's activities. This includes ensuring the provision of effective planning, organisation, control, monitoring and review together with the application of preventative and protective measures.

The Highways Agency ensures that (potential) Service Providers have the competence and resources to comply with the requirements of the Management Regulations by use of their tender assessment process. This process includes determining the extent of the Service Provider's health and safety management systems, how they control risk within their organisation, including the level of training provided to staff, their monitoring processes to assess the effectiveness of the health and safety management system and their review process.

1.2.1.1 Risk Assessment

The Management of Health and Safety at Work Regulations 1999 require the employer to undertake suitable and sufficient assessments of the risks to the health and safety at work of his employees to which they are exposed and the risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking. Guidance on the completion of risk assessments is available on the [HSE web site](#), e.g. 5 Steps to Risk Assessment.

In support of this, the Highways Agency provides, where reasonably practicable, any information to the Service Provider to aid this process. Such information may include details of land ownership, highway boundaries, 'as-built' drawings and health and safety files where these are available.

Following the appointment of a Service Provider a suitable and sufficient risk assessment process must be used by the Service Provider to adequately identify hazards and evaluate the risks relating to the contract and demonstrate that the proposed control measures are adequate for the management of the Network.

It is the duty of the Highways Agency to provide such information relating to the contract as is necessary for the Service Provider to conduct a suitable and sufficient risk assessment.

The Service Provider must produce suitable and sufficient written risk assessments of the work that is to be undertaken and they must comply with the Management of Health and Safety at Work Regulations.

It is expected that risk assessments will be qualitative for the majority of work undertaken in network management using a risk matrix to assess the outcome by consideration of likelihood and consequence, however if it is determined that quantitative risk assessments are necessary the Service Provider will undertake such work, possibly in conjunction with the client.

The Service Provider must ensure that the risk assessments are compiled adequately with the details briefed to personnel and contractors affected by the proposed works.

In relation to assessing urgency of works for barrier repairs – the use of the Highways Agency's risk based process should be adopted to ensure safety of the Network balanced with safety of road workers.

1.2.2 Workplace (Health, Safety and Welfare) Regulations

The Workplace (Health, Safety and Welfare) Regulations 1992 and its associated Approved Code of Practice were introduced to provide a recognised minimum standard of health and safety provision and welfare facilities for workplaces. As well as offices and depots owned or leased by the Highways Agency and the Service Provider this also includes offices and depots owned or leased by others for the use of Highways Agency staff and Service Provider's staff.

These regulations exclude construction sites, including site offices.

1.2.3 Construction (Design and Management) Regulations

The Construction (Design and Management) Regulations 2007 (CDM Regulations) came into force on 6th April 2007. They replace the CDM Regulation 1994 and incorporate duties from the now withdrawn Construction (Health, Safety and Welfare) Regulations 1996. The key aim of the CDM Regulations is to integrate health and safety into the management of the project and to encourage everyone involved to work together to:

- Improve the planning and management of projects from the very start;
- Identify hazards early on, so they can be eliminated or reduced at the design or planning stage and the remaining risks can be properly managed;
- Target effort where it can do the most good in terms of health and safety, and;
- Discourage unnecessary bureaucracy.

An Approved Code of Practice (ACOP), Managing Health and Safety in Construction (HSE publication reference L144), provides practical guidance on complying with the duties set out in the CDM Regulations.

The CDM Regulations are intended to focus attention on planning and management throughout construction projects, from concept and feasibility, through planning and design, tender/selection, construction phase and the commissioning, handover and eventual decommissioning and demolition. They are relevant to the majority of the work undertaken by the Highways Agency and Service Provider for routine, cyclical and improvement works on the trunk road network.

Specific duty holders are defined in the CDM Regulations and their duties defined. The duty holders are:

- Client;
- CDM Co-ordinator;
- Designer;
- Principal contractors, and;
- Contractors.

The extent of duties to be discharged by the various duty holders, in relation to network management, is detailed in the following section at 1.3.

The Highways Agency would normally envisage that, subject to being satisfied as to their competence, they appoint the Service Provider as CDM co-ordinator, principal contractor and designer.

The applicability of certain of the regulations is dependent on whether the project is notifiable, i.e. those projects for which the construction phase is likely to involve more than 30 working days or more than 500 person days of construction works.

To ensure a high standard of health and safety management for the work undertaken on behalf of the Highways Agency, all the construction / maintenance work must be carried out by the Service Provider in accordance with the CDM Regulations, irrespective of whether it is notifiable or not, with appropriate works order systems to identify procedural compliance.
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Additionally there are documents that must be produced to comply with the CDM regulations. Such documentation is identified below.

1.3 Roles and Responsibilities

The CDM regulations apply to construction projects and define obligations for various parties. Those duties are detailed.

1.3.1 Client

Under the CDM Regulations the term (client) is defined in relation to construction work as any individual or organisation for whom a construction project is carried out, so for highway works on the trunk road network. In England this, in all but the most exceptional circumstances, is the Highways Agency. The definition of construction work includes maintenance works.

The HSE Approved Code of Practice and Guidance document for CDM Regulations defines the duties for clients. In its capacity as client, the Highways Agency must make sure that:

- Designers, contractors and other team members that they propose to engage are competent (or work under the supervision of a competent person), are adequately resourced and appointed early enough for the work that they have to do;
- They allow sufficient time for each part of the project, from concept onwards;
- They co-operate with others concerned in the project as is necessary to allow other dutyholders to comply with their duties under the CDM Regulations;
- They co-ordinate their own work with others involved with the project in order to ensure the safety of those carrying out the construction work, and others who may be affected by it;
- There are reasonable management arrangements in place throughout the project to ensure that the construction work can be carried out, so far as is reasonably practicable, safely and without risk to health. (This does not mean managing the works themselves, as few clients have the expertise and the resources and it can cause confusion);
- Contractors have made arrangements for suitable welfare facilities to be provided from the start and throughout the construction phase;
- Any fixed workplaces (for example offices, shops, factories, schools) which are to be constructed will comply, in respect of their design and the materials used, with any requirements of the Workplace (Health, Safety and Welfare) Regulations 1992;
- Relevant information likely to be needed by designers, contractors or others to plan and manage their work is passed to them in order to comply with the CDM Regulations (regulation 10).
- Appoint a CDM co-ordinator to advise and assist with their duties and to co-ordinate the arrangements for health and safety during the planning phase;
- Appoint a principal contractor to plan and manage the construction work, preferably early enough for them to work with the designer on issues relating to buildability, usability and maintainability;
- Ensure that the construction phase does not start until the principal contractor has prepared a suitable construction phase plan and made arrangements for suitable welfare facilities to be present from the start of the work;
- Make sure the health and safety file is prepared, reviewed, or updated ready for handover at the end of the construction work. This must be kept available for any future construction work or to pass on to a new owner..

Prior to appointing the Service Provider to undertake the work of managing and maintaining the trunk road network, the Highways Agency provides relevant health and safety information, the pre construction information – see 1.3.6.1, of the assets to tenderers. Such information may be provided via various methods including within contract documents, provision or access to Highways Agency departmental standards, guidance and advice notes and other documents such as maintenance manuals and as-built records. The Network Management Manual and other Highways Agency documents may also contribute to the design or have some influence over part of the design.

1.3.2 The CDM Co-ordinator

Where the client has appointed a CDM co-ordinator, they undertake a number of duties, to provide the client with a key project advisor in respect of construction health and safety risk management matters. They should assist and advise the client on appointment of competent contractors and the adequacy of management arrangements; ensure proper co-ordination of the health and safety aspects of the design process; facilitate good communication and co-operation between project team members and prepare the health and safety file.

If appointed by the Highways Agency as CDM Co-ordinator the Service Provider must:-

- give suitable and sufficient advice and assistance to clients in order to help them to comply with their duties, in particular:
 - The duty to appoint competent designers and contractors, and;
 - The duty to ensure that adequate arrangements are in place for managing the project;
- Notify HSE about the project;
- Co-ordinate design work, planning and other preparation for construction where relevant to health and safety;
- Identify and collect the pre-construction information and advise the client if surveys need to be commissioned to fill significant gaps;
- Promptly provide in a convenient form to those involved with the design of the structure; and to every contractor (including the principal contractor) who may be or has been appointed by the client, such parts of the pre-construction information which are relevant to each;
- Manage the flow of health and safety information between clients, designers and contractors;
- Advise the client on the suitability of the initial construction phase plan and the arrangements made to ensure that welfare facilities are on site from the start;
- Produce or update a relevant, user friendly, health and safety file suitable for future use at the end of the construction phase.

The appointment of the CDM Co-ordinator may be monitored by the Highways Agency and may be terminated, changed or reviewed as necessary. This monitoring may be carried out within regular audits, such as Traffic Operations Contract Compliance Audit (TOCCA).

1.3.3 Designers

Designers are in a unique position to reduce the risks that arise during construction work, and have a key role to play in the CDM Regulations. Designs develop from initial concepts through to a detailed specification, often involving different teams and people at various stages. At each stage, designers from all disciplines can make a significant contribution by identifying and eliminating hazards, and reducing likely risks from hazards where elimination is not possible.

To help achieve those objectives, designers should:

- Make sure that they are competent and adequately resourced to address the health and safety issues likely to be involved in the design;
- Check that clients are aware of their duties;
- When carrying out design work, avoid foreseeable risks to those involved in the construction and future use of the structure, and in doing so, they should eliminate hazards (so far as is reasonably practicable, taking account of other design considerations) and reduce risk associated with those hazards which remain;
- Provide adequate information about any significant risks associated with the design;
- Co-ordinate their work with that of others in order to improve the way risks are managed and controlled;
- Ensure that the client has appointed a CDM co-ordinator;

- Ensure that they do not start design work other than initial design work unless a CDM co-ordinator has been appointed;
- Co-operate with the CDM co-ordinator, principal contractor and with any other designers or contractors as necessary for each of them to comply with their duties. This includes providing any information needed for the pre-construction information or health and safety file.

Service Providers appointed as designer should discharge the duties bulleted above.

1.3.4 Principal Contractor

Good management of health and safety on site is crucial to the successful delivery of a construction project. The key duty of principal contractors is to properly plan, manage and co-ordinate work during the construction phase in order to ensure the risks are properly controlled. Principal contractors must also comply with the duties placed on all contractors under the regulations.

When appointed as principal contractor, the Service Provider must:

- Satisfy themselves that clients are aware of their duties, that a CDM co-ordinator has been appointed and HSE notified before they start work;
- Make sure that they are competent to address the health and safety issues likely to be involved in the management of the construction phase;
- Ensure that the construction phase is properly planned, managed and monitored, with adequately resourced, competent site management appropriate to the risk and activity;
- Ensure that every contractor who will work on the project is informed of the minimum amount of time which they will be allowed for planning and preparation before they begin work on site;
- Ensure that the contractors are provided with the information about the project that they need to enable them to carry out their work safely and without risk to health. Requests from contractors for information should be met properly;
- Ensure safe working and co-ordination and co-operation between contractors;
- Ensure a suitable construction phase plan (see 1.3.6.2) is:
 - a. Prepared before construction work begins
 - b. Developed in discussion with, and communicated to, contractors affected by it
 - c. Implemented, and
 - d. Kept up to date as the project progresses
- Satisfy themselves that the designers and contractors that they engage are competent and adequately resourced;
- Ensure suitable welfare facilities are provided from the start of the construction phase;
- Take reasonable steps to prevent unauthorised access to the site;
- Prepare and enforce any necessary site rules;
- Provide (copies of or access to) relevant part of the construction phase plan and other information to contractors, including the self-employed, in time for them to plan their work;
- Liaise with the CDM co-ordinator on design carried out during the construction phase, including design by specialist contractors, and its implications for the construction phase plan;
- Provide the CDM co-ordinator promptly with any information relevant to the health and safety file (see 1.3.6.3);
- Ensure that all workers have been provided with suitable health and safety induction, information and training;
- Ensure that the workforce is consulted about health and safety matters;
- Display the project notification

1.3.5 Contractors

Contractors and those actually doing the construction work are most at risk of injury and ill health. They have a key duty to play, in co-operating with the principal contractor, in planning and managing the work to ensure that risks are properly controlled. Anyone who directly employs, engages construction workers or controls or manages construction work is a contractor for the purpose of the CDM Regulations.

Contractors must:

- Check clients are aware of their duties;
- Satisfy themselves that they and anyone they employ or engage are competent and adequately resourced
- Plan, manage and monitor their own work to make sure that workers under their control are safe from the start of their own work on site;
- Ensure that any contractor who they appoint or engage to work on the project is informed of the minimum amount of time which will be allowed for them to plan and prepare before starting work on site;
- Provide workers under their control (whether employed or self-employed) with any necessary information, including about relevant aspects of other contractors' work, and the site induction (where not provided by a principal contractor) which they need to work safely, to report problems or to respond appropriately in an emergency;
- Ensure that any design work they do complies with CDM Regulation 11;
- Comply with the requirements listed in schedule 2 (welfare facilities) and part 4 (duties relating to health and safety on construction sites) of the regulations that apply to their work;
- Co-operate with others and co-ordinate their work with others working on the project;
- Ensure the workforce is properly consulted on matters affecting their health and safety, and;
- Obtain specialist advice (for example from a structural engineer or occupational hygienist) where necessary when planning high-risk work.

1.3.6 CDM Deliverables

One of the principles underlying the CDM Regulations is of having "The right information for the right people at the right time". To achieve this, initial information is collected and made available for consideration and inclusion from which a construction phase Health and Safety Plan is developed. As the project progresses through the preparation and construction phases this is developed to form a detailed document covering all aspects of health and safety of the project, construction, maintenance and demolition.

1.3.6.1 Pre-Construction Information

Project specific health and safety information needed to identify hazards and risks associated with the design and construction work is termed pre-construction information. It should concentrate on those issues that designers and contractors could not reasonably be expected to anticipate or identify, and not on obvious hazards such as the likelihood that the project would involve work at height. The Highways Agency will make such information available to prospective Service Providers as part of the invitation to tender documents.

Following their appointment as CDM co-ordinator, the Service Provider must develop (typically for maintenance and improvement projects) the pre-construction information for use by their designers, other designers, principal contractors and contractors.

1.3.6.2 Construction Phase Plan

The way in which the construction phase will be managed and the key health and safety issues for the particular project must be set out in writing in the construction phase plan. This plan should set out the organisations and arrangements that have been put into place to manage risk and co-ordinate the works on site. It should not be a repository for detailed generic risk assessments, records of how decisions were reached or detailed method statements, but it may, for example set out when such documents will need to be prepared.

The development of a construction phase plan becomes the responsibility of the principal contractor upon appointment of the contract for the construction phase of the project where it will reflect the principal contractor's health and safety intentions for the project.

Service Providers, appointed as principal contractor, must prepare a construction phase plan in accordance with the requirements of 1.3.4

IAN 105/08 sets out the minimum standard required by the Highways Agency for the preparation of a Health and Safety Plan, the term previously given to the construction phase plan.

1.3.6.3 Health and Safety File

The CDM Regulations further require the preparation and handover of a Health and Safety File for each project containing relevant health and safety information on its design, construction, maintenance or demolition. The Health and Safety File will provide a record to assist persons undertaking future construction, improvement, maintenance or demolition work on the project or structures making up the project, for retention by the client. It is prepared during a project to ensure it is ready to be handed over to the client upon completion of that project.

The Service Provider, appointed as CDM co-ordinator, is responsible for producing a relevant and user friendly Health and Safety File and upon completion its handover to the Service Manager. The Health and Safety File must include information from small maintenance projects that may affect the future safe maintenance of the trunk road network.

The Health and Safety File must be in a format that can be easily updated where required and made available for inspection by any person who may need access to information contained therein.

To facilitate this, details relating to the format, media and storage of the Health and Safety File must be agreed with the Service Manager by the CDM co-ordinator on a project-specific basis, and as determined by IAN 105/08 (see below). The Highways Agency however envisages that responsibility for storage of documents contained in or referenced to the Health and Safety File will normally reside with the Service Provider, noting that the Health and Safety Files will be passed to another Service Provider should there be a change of contract

IAN 105/08 sets out the minimum standards required by the Highways Agency, as client under the CDM Regulations, regarding the Health and Safety File for projects involving construction work on the trunk road network.

1.4 Legislation Register

This section lists many of the legislative acts and regulations that are considered important and relevant to the work of personnel undertaking any of the activities or subjected to any of the conditions as described in the Network Management Manual. They act as a prompt for the client and Service Provider in ensuring that they are fully aware of the existence and main health and safety requirements of each act or regulation. This list is comprehensive but not complete and it is the responsibility of the client and Service Provider to ensure that they comply with other less well known or obscure legislation or regulation relating to network management work to be undertaken. This responsibility extends to new health and safety legislation that may be introduced during the lifespan of the Network Management Manual.

It has become standard practice to support health and safety regulations, where possible, with an Approved Code of Practice (ACoP) or HSE/HSC Guidance to explain the practicalities of complying with the requirements of the regulations. Where such ACoP's or HSE/HSC Guidance are relevant they have been noted in the register.

The following tables are set out, in alphabetical order, to show the following:

- Table A. Principal Acts
- Table B. Main Regulations (including Approved Codes of Practice and Guidance)
- Table C. Legislation used in Civil Law

Table A. Principal Acts	Interpretation
Fire Precautions Act 1971 (FPA)	<p>The principle instrument for the control of fire safety in occupied premises. It is designed to ensure the provision of adequate fire precautions and prevention, means of escape and related fire precautions in premises within its scope. Fire authorities are responsible for the issue of the fire certificates and have a duty to enforce the provisions of the Act and the Regulations made under it. A fire certificate is required for certain premises, and this may also apply to trunk road maintenance depots.</p>
Health and Safety at Work, etc. Act 1974 (HSWA)	<p>Key objectives are:</p> <ul style="list-style-type: none"> • to secure the Health, Safety and Welfare of all people at work, and; • to protect third parties from the risks arising from workplace activities. <p>The Act establishes principles of safety responsibility on employers, employees, manufacturers, suppliers, designers and importers, and established the corporate bodies of the Health and Safety Commission and Health and Safety Executive.</p> <p>The employer's duties are:</p> <ul style="list-style-type: none"> • to provide a statement of health and safety policy; • to provide and maintain plant and equipment that is safe and without risks to health, so far as is reasonably practicable; • to ensure safe handling, storage and transport of articles and substances; • to provide adequate information, instruction, training and supervision; • to provide safe premises and safe access/egress; • to provide a safe working environment and welfare arrangements; • not to charge employees for things done or provided in the interest of health and safety; • to consult with employees about health and safety. <p>Self employed workers, other employees and the general public must not be exposed to unacceptable risk from any work activity.</p> <p>Designers, manufacturers, suppliers and installers must ensure that articles, i.e. physical objects and substances are safe and without risk so far as is reasonably practicable before they are used, erected or installed.</p> <p>Employees must take reasonable care of their own health and safety and that of others who may be affected by their actions.</p>
Highways Act 1980	<p>Makes a requirement to ensure free passage for pedestrians and vehicles is maintained around work sites. Permission for works on the public highway must be obtained from the relevant Highway Authority, which is the Highways Agency for the trunk road network in England. Licenses for hoardings, forced storage areas, skips, etc, affecting the public highway are required.</p>

Table A. Principal Acts	Interpretation
New Roads and Street Works Act 1991 (NRSWA)	All excavations in roadways are licensed and co-ordinated, normally by the Local Authority who grants licenses for the placement, retention and maintenance of apparatus in roadways, and provides notice and co-ordination of street works.
Railways Act 1993	Primarily concerned with the privatisation of the national railway. Section 117(2) requires secure, proper construction and safe operations for railways and for the protection of the public from injury and other risks arising from construction and operation of the railway.
Traffic Management Act 2004	<p>Part 1 allows for the establishment of a uniformed on-road traffic officer service implemented by the Highways Agency.</p> <p>Part 2 imposes a duty on all local traffic authorities to plan and implement traffic movements on the network with the appointment of a 'Traffic Manager'.</p> <p>Part 3 provides for the introduction of permit schemes for both street works and road works.</p> <p>Part 4 provides for changes to the regulatory requirements of Part 3 of the New Roads and Street Works Act 1991, including increases in the level of fines for specified offences.</p> <p>Part 5 includes specific measures to alter the arrangements for traffic management in London including for enhanced TfL (Transport for London) powers in decisions affecting strategic roads. Amendments are also made to the Highways Act 1980 broadening the scope of lane rental charges to apply to skips, scaffolding, temporary excavations, etc.</p> <p>Part 6 includes powers providing a single framework to make regulations for the civil enforcement by local authorities (outside and including London) for parking and waiting restrictions, bus lanes and some moving traffic offences.</p> <p>Part 7 introduces miscellaneous powers including the ability for discrete inspection of Blue Badge Scheme parking permits and an associated offence for failure to produce a badge when required to do so. Also included is provision for the application of surplus income from parking places and financial provision for the establishment of traffic officers.</p>
Transport and Works Act 1992	These regulations apply to employees working on or near railways and tramways. They require that employees must not report for duty under the influence of drugs or alcohol. Staff engaged in safety critical work will be subject to random drugs and alcohol tests.

Table B. Main Regulations	Interpretation
Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP)	<p>The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP) define the system for classification and labelling of substances and preparations dangerous for supply. This system applies to all dangerous substances and preparations as defined in the Regulations.</p> <p>An integral part of CHIP is the Approved Supply List which has been approved by the Health and Safety Commission and contains detailed information about substances to assist manufacturers, importers and suppliers having responsibilities under CHIP.</p> <p>For the purposes of classification and labelling, this comprises:</p> <ul style="list-style-type: none"> • information to be shown on labels when the substance is supplied in packages; and • information to be used to derive the classification and supply labels for preparations containing the substance.
Confined Spaces Regulations 1997 and Approved Code of Practice	<p>Defines confined spaces as any place or other space which, by virtue of its enclosed nature has a reasonably foreseeable specified risk. This includes:</p> <ul style="list-style-type: none"> • fire and/or explosion; • loss of consciousness; • drowning; • oxygen deficient atmosphere; • asphyxiation (including free flowing solids). <p>Wherever possible, entry to confined spaces must be avoided – this must be considered at the design stage.</p> <p>Competent persons must complete risk assessments for work within a confined space.</p> <p>If entry into a confined space is unavoidable then a safe system of work must be designed and implemented, i.e., a permit to work.</p> <p>Individuals entering a confined space must have received relevant training and hold a current certificate of conformance.</p> <p>Plant and equipment must be suitable for use in confined spaces.</p> <p>Adequate emergency arrangements must be in place before work starts.</p>
Construction (Design and Management) Regulations 2007 (CDM) ACoP and Guidance	<p>These regulations cover the health and safety management of a construction project from its inception through to the completion of the construction, and the commissioning and handover, and includes decommissioning and demolition.</p> <p>The regulations require:</p> <ul style="list-style-type: none"> • a realistic project programme with adequate time allowed for planning, preparation and the work itself; • early appointment of key people;

Table B. Main Regulations	Interpretation
Construction (Design and Management Regulations 2007 (CDM) ACoP and Guidance (continued))	<ul style="list-style-type: none"> • competent duty holders with sufficient resources to meet their legal duties; • early identification and reduction of risks; • provision of health and safety information from the start of the design phase, through construction and maintenance to eventual demolition, so that everyone can discharge their duties effectively; • co-operation between duty holders; and • effort and resources proportionate to the risk and complexity of the project to be applied to managing health and safety issues. <p>These regulations now cover the implementation of safe controls on a construction site (previously Construction (Health, Safety & Welfare) Regs 1996):</p> <ul style="list-style-type: none"> • safe places of work; • precautions against falls and falling objects; • prevention or avoidance of drowning; • ventilation, temperature, lighting; • stability of structures; • excavations, demolition, explosives, cofferdams; • traffic routes, vehicles, doors and gates; • emergency procedures, fire prevention and detection; • welfare facilities, good order; • training, inspection, reports
Construction (Head Protection) Regulations 1989	<p>These regulations have a simple requirement – everyone except turban wearing Sikhs, working in the construction industry must wear suitable head protection whenever there is a risk of injury to the head from falling objects or hitting the head against something. To achieve this requirement, the regulations place duties on employers, on the person in control of others, on individual employees and self-employed persons as follows:</p> <ul style="list-style-type: none"> • suitable head protection must be worn, i.e. it must conform to the equivalent standard, such as BS EN 397 (safety helmets), BS EN 812; (bump caps); • new head protection must be CE marked to indicate it complies with the PPE regulations; • head protection must be provided to employees and visitors on site by the employer; • employers must ensure that head protection is worn unless there is no foreseeable risk of injury to the head other than a fall; • employees to make full and proper use of head protection provided and to return it to the correct storage facility, and report defects or loss; • employees must comply with any employer rules; • head protection must be replaced at recommended intervals and when damaged.
Control of Asbestos Regulations 2006 and Approved Code of Practice	<p>These regulations place an explicit duty on employers in occupation of premises to ensure that certain requirements are carried out. This includes:</p> <ul style="list-style-type: none"> • locate materials likely to contain asbestos; • maintain written records of their location;

Table B. Main Regulations	Interpretation
Control of Asbestos Regulations 2006 and Approved Code of Practice (continued)	<ul style="list-style-type: none"> • assess the risk of exposure; • prepare and implement a management plan to control these risks. • laboratories used to undertake site clearance certification must be accredited • work with asbestos insulation, some textured coatings and asbestos insulation board must only be undertaken by a licensed contractor <p>Additional duties are placed on other parties who have an obligation to maintain and repair the premises to enable the employer to meet these requirements, as follows;</p> <ul style="list-style-type: none"> • notifiable work in the presence of asbestos must be reported to the HSE at least 14 days prior to the work commencing; • exposure must be reduced to as low as reasonably practicable even when respiratory protection is worn; • laboratories used to analyse suspected ACM's (asbestos containing materials) must be accredited; • contractors involved in the work must be informed of the presence of asbestos; • health surveillance is provided where required. <p>These regulations place an explicit duty on employers in occupation of premises to ensure that certain requirements are carried out. This includes:</p> <ul style="list-style-type: none"> • locate materials likely to contain asbestos; • maintain written records of their location; • assess the risk of exposure; • prepare and implement a management plan to control these risks. <p>Additional duties are placed on other parties who have an obligation to maintain and repair the premises to enable the employer to meet these requirements, as follows;</p> <ul style="list-style-type: none"> • notifiable work in the presence of asbestos must be reported to the HSE at least 14 days prior to the work commencing; • exposure must be reduced to as low as reasonably practicable even when respiratory protection is worn;
Control of Lead at Work Regulations 2002 (CLAW) and Approved Code of Practice	<p>Mandates the requirement to protect the health of people at work by preventing, or where not reasonably practicable, adequately controlling their exposure to lead and to monitor the amount of lead that employees absorb within allowable limits. Individuals whose work involves significant exposure (as defined by the Regulations) to lead at work must be screened at work to prevent their health being affected.</p> <p>The use of lead based products must be avoided so far as is reasonably practicable. When work has to be undertaken risk assessments are required to determine the likely presence of lead. This is particularly relevant with hot work where welding may involve contact with old lead based paints.</p> <p>Employees must receive training and information. In particular, they need to be aware of the importance of hygiene when coming into contact with lead based materials.</p>

Table B. Main Regulations	Interpretation
Control of Lead at Work Regulations 2002 (CLAW) and Approved Code of Practice (continued)	<p>Adequate control measures must be implemented with the use of PPE as a last resort.</p> <p>Medical surveillance may also be required.</p>
Control of Substances Hazardous to Health Regulations 2002 (COSHH) and Approved Code of Practice	<p>Hazardous substances are defined in the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP). These regulations mandate assessments for use of, and exposure to hazardous substances within Workplace Exposure Limits (WEL's) which are detailed in a separate document produced annually by the HSE, EH40.</p> <p>The main requirements of the COSHH Regulations are as follows:</p> <ul style="list-style-type: none"> • when a substance is to be used, a risk assessment must be carried out to consider its use and identify the control measures. Control measures must be properly maintained to ensure they continue to be effective; • users of hazardous substances must be trained in their use and receive relevant information; • Relevant COSHH assessments must be available for employees at the location where work is being carried out; • in certain circumstances the monitoring of exposure to employees and health surveillance is required; • when considering the use of a substance a safer alternative / substitute must always be considered.
Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)	<p>These regulations apply to employers and the self-employed at most workplaces where a dangerous substances is, or could be, present. They set minimum requirements for the protection of employees from fire and explosion risks related to dangerous substance and potentially explosive atmospheres. An explosive atmosphere is an accumulation of gas, mist, dust or vapour mixed with air.</p> <p>Dangerous substances include:</p> <ul style="list-style-type: none"> • petrol and liquefied petroleum gas,; • paints and varnishes; • solvents; • certain types of dust (e.g. wood dust). <p>DSEAR must be considered when working on construction activities in high risk environments.</p> <p>The main requirements of the regulations are to:</p> <ul style="list-style-type: none"> • carry out formal risk assessment of the fire and explosion risks of any work activities involving dangerous substances (this must be done regardless of the amount of hazardous substance in use or explosive atmosphere present); • provide measures to eliminate or reduce so far as is reasonably practicable the risk of fire or explosion; • apply measures, so far as is reasonably practicable to control risks and mitigate the detrimental effects of a fire or explosion;

Table B. Main Regulations	Interpretation
Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) (continued)	<ul style="list-style-type: none"> • provide equipment and procedures to deal with accidents and emergencies; • provide employees with information and adequate training.
Electrical Equipment for Explosive Atmospheres (Certification) Regulations 1990 (Amended 1999)	<p>These Regulations address the measures for safety and consumer protection in relation to electrical equipment and any provisions concerning the composition, labelling, marketing, classification or description of electrical equipment. A Certificate of Conformity and a Certificate of Inspection must accompany equipment for use in explosive atmospheres from a certified body. It also requires the manufacturer to issue the appropriate distinctive community mark (CE) and supply with the equipment instructions defining the specialist conditions governing the use of the equipment.</p>
Electricity at Work Regulations 1989	<p>Applies to almost all workplaces. Precautions must be taken against the risk of death or personal injury from electricity during work activities. Duties are imposed on persons in respect of electrical systems, electrical equipment, conductors and work activities on or near electrical equipment as follows:</p> <ul style="list-style-type: none"> • only competent individuals with technical knowledge and experience, including those working under supervision are to undertake work on electrical systems and equipment; • safe systems of work must be employed when working with electrical equipment; • adequate working space, access and lighting is to be provided to avoid injury from dangerous situations; • electrical equipment is properly maintained; • systems must be protected from adverse or hazardous environments, and be designed with safety factors to accommodate potential transient and overload conditions; • conductors which may give rise to danger must be insulated, or if exposed, suitable precautions must be taken to place in safe locations with warning notices and ensure associated safe working practices; • adequate precautions by earthing or by other suitable means are to be taken to prevent danger from electrical equipment that may become charged; • restrictions are placed on inserting devices into any conductor connected to earth and any allowable jointing of systems, including plugs and sockets, must be suitable for the purpose; • systems or parts of systems must be protected from overload (fuses, circuit breakers etc.); • suitable means must be provided for cutting off the current and isolating equipment, including the prevention of such equipment becoming live during any subsequent work (removal of fuses etc.); • work is not allowed on or near any 'live' conductors unless the person is trained and qualified. When such work is necessary suitable precautions must be implemented.
Employer's Liability (compulsory Insurance) Regulations 1998	<p>Employers must maintain an insurance policy with an authorised insurer for employee's injury and ill health. A copy of the certificate must be displayed in a prominent place at all offices and other places of work.</p>

Table B. Main Regulations	Interpretation
Fire Precautions (workplace) Regulations 1997	<p>These regulations apply to most, but not all, workplaces where people are employed. They enforce obligations on employers the responsibility for the safety of their employees in case of fire. This legislation mandates the need for documented fire risk assessments including for premises with a fire certificate and implementation of control measures. The legislation requires provision for:</p> <ul style="list-style-type: none"> • fire-fighting equipment and fire detection devices and their appropriate maintenance; • emergency routes and exits.
Health and Safety (Consultation with Employees) Regulations 1996 Safety Committees and Safety Representatives Regulations 1977 (SCSR)	<p>Employers must consult with employees regarding planning, organising, safety issues and the use of new equipment. Where staff are not covered by safety representatives this can be achieved by consulting with all staff or nominated groups. Additional requirements are:</p> <ul style="list-style-type: none"> • safety representatives must have time off for training; • information must be made available; • staff must not be penalised for raising safety issues. <p>SCSR relates to the recognition for trade unions to appoint safety representatives from among its employees.</p>
Health and Safety (information for Employees) Regulations 1989	<p>These regulations relate to the requirement to display The Health and Safety Law Poster and provide HSE and other contact details to all staff.</p>
Health and Safety (Display Screen Equipment (DSE)) Regulations 1992 and Guidance	<p>All workstations with display screen equipment must be assessed to ensure they meet the requirements of the schedule, contained within the regulations. The assessment must include consideration of the following:</p> <ul style="list-style-type: none"> • ensure sufficient workspace; • adequate and proper lighting; • fully adjustable chair; • suitable positioning of PC to avoid glare and flicker. <p>There is also a requirement to ensure suitable training and information is provided and that employees have sufficient work breaks and activity changes. Employers are required to provide users of DSE with appropriate suitable eye tests upon request, and if required special corrective appliances.</p>
Health and Safety (First Aid) Regulations 1981	<p>Details the first aid equipment and training (for selected staff) to be provided (based on risk assessment) and the need to inform staff of the first aid arrangements.</p> <p>Requirements must reflect the nature of the workplace such as:</p> <ul style="list-style-type: none"> • positioning of first aid equipment, (close to high risk areas); • calculate the number of first aiders required in relation to number of staff ; • and tasks being undertaken.

Table B. Main Regulations	Interpretation
Health and Safety (First Aid) Regulations 1981 (continued)	<p>Facilities must contain appropriate sign posting, this must be considered in relation to activities being undertaken.</p> <p>There must be provision of adequately trained personnel and suitable first aid equipment.</p> <p>Employers must provide information to staff on provision of first aid.</p>
Health and Safety (Safety Signs and Signals) Regulations 1996	<p>These Regulations identify the minimum requirements for the provision of safety signs at work. Regulations require employers to use a safety sign where there is a significant risk to health and safety that has not been avoided or controlled by the methods required under the relevant law, provided use of a sign can help reduce the risk. Safety signs are not a substitute for those methods of controlling risk such as engineering controls or safe systems of work. They apply to all workplaces and to all activities where people are employed, but exclude signs used in connection with the transport, supply and marketing of dangerous substances, products and equipment.</p> <p>The regulations require, where necessary, the use of road traffic signs in workplaces to regulate road traffic.</p> <p>The regulations require employers to ensure that safety signs are provided (or are in place) and maintained.</p> <p>When determining the need for signs, employers need to take into account the results of risk assessments.</p> <p>Four types of safety signs are identified in the regulations:</p> <ul style="list-style-type: none"> • mandatory; • prohibition; • warning; • emergency escape/first aid signs. <p>These regulations also provide the minimum requirements for acoustic signs, illumination, hand signs, verbal communication, traffic routes and fire fighting equipment.</p>
Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) and ACoP	<p>These regulations require the employer to ensure the following:</p> <ul style="list-style-type: none"> • lifting equipment must be constructed to be suitable for its purpose; • the working conditions and persons in the vicinity are considered; • lifting equipment is of suitable strength and capability for the load; • all lifting operations must be planned, supervised and carried out in a safe manner; • where required, examination, testing and inspection of lifting equipment is properly conducted; • suitable records are kept of any such examination, testing and inspections; • the safe working load (SWL) of all lifting equipment must be clearly indicated;

Table B. Main Regulations	Interpretation
Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) and ACoP (continued)	<ul style="list-style-type: none"> • lifting equipment exposed to adverse conditions liable to result in dangerous situations must be thoroughly examined by a competent person and records kept; • equipment must have a current certificate of examination.
Management of Health and Safety at Work Regulations 1999 (MHSW) and Approved Code of Practice	<p>MHSW identifies the way in which Duties under the HSWA can be undertaken.</p> <p>The key requirement is for the employer to conduct a suitable and sufficient risk assessment of the locations and tasks that may affect workers and others. The risk assessment must;</p> <ul style="list-style-type: none"> • address normal and abnormal situations; • ensure significant findings are recorded; • be reviewed and evaluated at appropriate intervals and when any working situation changes. <p>Other requirements are:</p> <ul style="list-style-type: none"> • health and safety arrangements must be in place to manage risk and implement controls. • required health surveillance must be carried out when there is an identifiable disease or adverse health condition related to the work; • health and safety assistance must be provided by the employer to assist in complying with statutory provisions; • where tenants or contractors share a premises or site location, common risks must be shared through joint controls; • appropriate procedures must be established for serious and imminent danger; • host employers must ensure anyone carrying out work in or on their premises receive relevant health and safety information; • health and safety training, including refresher training must be given to safeguard against risk; • temporary workers must be provided with relevant health and safety information; • employees must co-operate with the employer in the pursuit of all of the above; • risk assessments must be conducted for new and expectant mothers; • protection must be provided to young workers from risks arising through lack of experience, lack of awareness or immaturity.
Manual Handling Operations Regulations 1992 and Guidance	<p>Employers must protect workers from manual handling injuries. Employers must:</p> <ul style="list-style-type: none"> • avoid the need for hazardous manual handling where possible (e.g. by doing jobs in a different way to eliminate or minimise handling); • assess the risk of injury from any hazardous manual handling task that cannot be avoided, and ensure the risk is reduced to a level as low as is reasonably practicable; • put measures in place to reduce the risk of injury, once risks have been assessed, including provision of information to employees and, where reasonably practicable, precise information relating to weight and configuration.

Table B. Main Regulations	Interpretation
Manual Handling Operations Regulations 1992 and Guidance (continued)	Employees are to make full use of systems put in place to reduce risk from manual handling.
Noise at Work Regulations 2005	<p>These regulations require the following:</p> <ul style="list-style-type: none"> • the implementation of a hierarchy of risk controls; • employers must reduce the risk to as low as reasonably practicable without PPE; • the completion of appropriate risk assessments, including specific noise assessments, which must be completed by competent persons where noise exceeds defined action levels; • records must be kept of the risk and noise assessments undertaken; • persons entering hearing protection zones must use appropriate hearing protection; • steps must be taken to reduce noise where practicable. <p>Two action levels are specified as follows:</p> <ul style="list-style-type: none"> • Lower exposure action levels are <ul style="list-style-type: none"> • a daily or weekly personal noise exposure of 80 dB (A-weighted); and • a peak sound pressure of 135 dB (C-weighted). • when breached requires the employer to ensure suitable hearing protection is available, maintained and repaired as necessary, and that adequate information, instruction and training is provided. • Upper exposure action levels are; <ul style="list-style-type: none"> • a daily or weekly personal noise exposure of 85 dB (A-weighted); and • a peak sound pressure of 137 dB (C-weighted). • when breached requires the employer to ensure suitable hearing protection is supplied and used, and ear protection zones are established and clearly signed with notices.
Personal Protective Equipment at Work Regulations 1992 (PPE) and Guidance	<p>These regulations set out the general requirements for the provision and use of personal protective equipment (PPE). The key requirements are as follows:</p> <ul style="list-style-type: none"> • provide a system whereby suitable PPE is provided; • risk assessment must be completed and consider the suitability of PPE; • suitable storage must be made available for PPE; • PPE must be properly maintained (including regular cleaning) in good condition and repair (including regular cleaning), and if not it must be reported for replacement to be provided; • where more than one item of PPE is used simultaneously it must be ensured that they are compatible; • employees to be provided with information, instruction and training to ensure proper use; • PPE must always be considered as a 'last resort' in terms of safety control.

Table B. Main Regulations	Interpretation
Pressure Systems Safety Regulations 2000 And Approved Code of Practice	<p>Users and owners of pressure systems are required to demonstrate that they know the safe operating limits, principally pressure and temperature, of their pressure systems, and that the systems are safe under those conditions.</p> <p>They need to ensure that a suitable written scheme of examination is in place before the system is operated.</p> <p>They also need to ensure that the pressure system is actually examined in accordance with the written scheme of examination.</p>
Provision and Use of Work Equipment Regulations 1998 (PUWER) and Approved Code of Practice	<p>These regulations address the need to ensure that where plant and equipment is required for work that it is suitable for the purpose and is properly maintained.</p> <p>Work equipment must be suited to the task and meet all statutory safety standards (including guarding and fail safe devices). Specific risks must be identified and suitable control measures implemented. Appropriate information, supervision and training must be provided (including refresher training). Inspections, where required, must be carried out by a competent person prior to work.</p> <p>Maintenance, where required, must be carried out by a competent person in accordance with the maintenance procedures for that equipment.</p>
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)	<p>These regulations identify certain incidents that require reporting to the relevant enforcing authority, what timescale is available for such reporting and the responsibilities for reporting such an incident. Incidents include fatalities, major injuries, injuries and absences resulting in more than 3 days off work, dangerous occurrences, specified diseases, and gas related incidents and incidents related to dangerous gas fittings.</p> <p>They also specify the reporting form to be used and the records to be kept and maintained.</p> <p>In general, road traffic accidents are not reportable except for specific work related incidents.</p>
Supply of Machinery (Safety) Regulations 1992	<p>Although these regulations place duties on the supply chain for the manufacture and supply of machinery it is incumbent on employers (i.e., user / purchaser) to ensure that the machinery they have purchased is accompanied by a Declaration of Conformity identifying the relevant safety standards.</p> <p>Where that machinery is intended for incorporation into other machinery, it must be accompanied by a Declaration of Incorporation (a Declaration of Conformity will apply once incorporation has taken place)</p> <p>All machinery must be marked with the appropriate CE mark to demonstrate it satisfies the relevant European Standards.</p>

Table B. Main Regulations	Interpretation
The Control of Vibration at Work Regulations 2005	<p>These regulations require the employer to undertake a suitable and sufficient assessment of the risks created by work that exposes workers to hand-arm vibration or whole body vibration.</p> <p>When the risk of exposure to hand-arm vibration is identified appropriate action must be taken to control that risk where exposure exceeds the daily exposure action value (EAV) of 2.5m/s^2 A(8). Employers also have to prevent exposure exceeding the daily exposure limit value (ELV) of 5m/s^2 A(8).</p> <p>When the risk of exposure to whole body vibration is identified appropriate action must be taken to control that risk where exposure exceeds the daily exposure action value (EAV) of 0.5m/s^2 A(8). Employers also have to prevent exposure exceeding the daily exposure limit value (ELV) of 1.15m/s^2 A(8).</p> <p>Control measures include alternative methods of working, job rotation, PPE and health surveillance. Employees must be provided with information and training on methods of controlling the risks from vibration. Health surveillance will need to be considered. Liaison with suppliers of machinery is necessary to ensure the most suitable equipment is available for use in line with regulations.</p>
Work at Height Regulations 2005	<p>The regulations define working at height as a place where a person could be injured falling from it, even if it is at or below ground level. The regulations require the employer to ensure:</p> <ul style="list-style-type: none"> • all work is properly planned and organised; • those involved in work at height are competent, or being supervised; • the risks from working at height are assessed and appropriate work equipment is selected and used; • the risks associated with working on or above fragile surfaces is properly controlled; • prevention of objects falling, or when not reasonably practicable, protection from falling objects; • identification of danger areas; • equipment for work at height is properly inspected and maintained. • suitable rescue arrangements are in place in the case of an emergency occurring at height <p>The Regulations include Schedules that provide requirements for the following:</p> <ul style="list-style-type: none"> • existing places of work and means of access for work at height; • collective fall prevention (e.g. guardrails and working platforms); • for collective fall arrest (e.g. nets, airbags etc); • personal fall protection (e.g. work restraints, fall arrest and rope access) and ladders.
Working Time Regulations 1998 (Amended 1999, 2001)	<p>These regulations restrict the number of additional hours that an employee can be asked to work. Where additional hours are required this must be by agreement between the employer and employee.</p> <p>They also provide restrictions on the number of hours and days worked</p>

Table B. Main Regulations	Interpretation
	without a break.
Workplace (Health, Safety and Welfare) Regulations 1992 and Approved Code of Practice	<p>These regulations address the health and safety issues within the workplace which include:</p> <ul style="list-style-type: none"> • maintenance within workplaces, including equipment, devices and systems; • comfort (ventilation, temperature, lighting, cleanliness) • workstations; • traffic routes (suitability, layout, organisation, segregation from pedestrian routes); • provision of rest areas; • sanitary and washing facilities; • drinking water; • accommodation for clothing and changing facilities; • temporary work sites (but not construction sites); • doors, windows, and other openings.

Table C. Legislation used in Civil Law	Interpretation (Some Regulations allow for civil redress)
Construction (Design and Management) Regulations 2007	Breach of a duty imposed by these regulations other than those imposed by regulation 10 and regulation 16(c), must not confer a right of action in any civil proceedings. There are certain exemptions to this in relation to the preparation of a Health and Safety Plan and the authorisation of persons onto premises where construction work is taking place.
Management of Health and Safety at Work Regulations 1999	Breach of a duty imposed by these regulations must not confer a right of action in any civil proceedings. There are certain exemptions to this in relation to new or pregnant mothers and young persons.
Occupiers Liability Act 1957 (OLA)	<p>Codifies an occupier's common law duty towards lawful visitors. The OLA does not define an occupier but it simply states that the rules, which have been held at common law to apply to an occupier of premises and his visitors, must also apply in relation to the Act. A lawful visitor is any person who has express or implied permission to be on the premises including; Police, Fire Brigade, Post Office delivery person, etc., to carry out their duties.</p> <p>The rules are widely regarded as being similar to those of a person in control of premises under Section 4 of the Health and Safety at Work Act, etc. 1974.</p> <p>The occupier has a duty to take all reasonable measures to ensure that the visitor will be safe whilst on the premises.</p>
Occupiers Liability Act 1984	<p>Codifies an occupier's common law duty towards unlawful visitors, i.e., trespassers. As above, the Act does not define an occupier but it simply states that the rules, which have been held at common law to apply to an occupier of premises and unlawful visitors, must apply in relation to this Act.</p> <p>The occupier has a duty with regard to unlawful visitors to take all reasonable measures to ensure that the unlawful visitor will be safe whilst on the premises.</p> <p>Consideration must be given to these issues in relation to the design of a premise, particularly when unoccupied or in a hazardous condition, e.g., anti-trespass guarding.</p>

1.5 Standards, Guidance & Information

In addition to existing legislative and regulatory requirements there are a number of other documents by various bodies that provide further guidance, support or direction. Whilst they do not have legal standing, they are produced to support existing regulations and legislation. It is expected that due cognisance is taken of these documents, particularly those produced by the HSE and the Health and Safety Commission (HSC), when developing a suitable system of work.

The Highways Agency also produce a number of documents as departmental standards, the use of which it is expected will allow the Service Provider to endorse and conform to their requirements.

Further to the above there are a number of organisations who provide valuable health and safety information through the internet, either free of charge or by subscription and may be considered a valuable source of information. Some of these have been listed alphabetically in Table D. Examples are HSE, British Standards, etc.

This list in Table D below is comprehensive but not complete and it is the responsibility of the Service Provider to ensure that they are aware of relevant documents that may be beneficial to the work to be undertaken.

Table D. Other Standards, Guidance, Information Documents, etc.	Interpretation
Avoidance of danger from overhead electrical lines HSE Guidance Note GS/6	This document covers detailed methods of working near or below overhead power lines.
Avoiding danger from underground services HSE Guidance booklet HS(G)47	This document covers all types of underground services likely to be encountered.
Breathing Apparatus and Respiratory Protective Equipment – A practical guide for users HSE Guidance Booklet HS(G)53	This provides advice on selection, use, training and storage of respiratory protective equipment (RPE).
British Standards Online	Provides access to all current British and European Standards, including those related to health and safety. www.bsonline.bsi-global.com
COSHH – A brief guide for Employers HSE Leaflet IND(G)136(L)	This guide gives a basic introduction to various aspects of the COSHH Regulations.
Dust: General Principles of protection HSE Guidance Note EH 44	An explanation of how the COSHH Regulations apply to dust and advice on prevention and control of exposure.

Table D. Other Standards, Guidance, Information Documents, etc.	Interpretation
Electrical Safety on Construction Sites HSG141	Provides advice on precautions to reduce the risk of electrical accidents during the construction phase.
Essentials of Health and Safety at Work	A useful guide from the HSE providing the general scope of health and safety law and practical guidance containing checklists, diagrams and photographs.
Five Steps to Risk Assessment	Provides a straightforward 5-step guide to conducting risk assessment. Suitable for large organisations and small to medium sized companies and organisations.
General Access Scaffolds and Ladders CIS 49	Practical guidance on scaffold access and ladders.
Guidance for Safer Temporary Traffic Management (produced by the Highways Agency)	Produced by the Highways Agency to promote a safe system of work for temporary traffic management operations through design, planning and implementation.
Health and Safety Executive website	The Health and Safety Commission is responsible for health and safety regulation in Great Britain. The Health and Safety Executive and local government are the enforcing authorities who work in support of the Commission. This website provides a link to many of the health and safety documents already mentioned in the Network Management Manual and provide valuable information relating to all aspects of health and safety.
Health and Safety in Construction HSG 150	Provides help and assistance on how to work safely on most tasks encountered on a construction site.
Health and Safety in Excavations HSG 185	Provides help and assistance on how to work safely in relation to excavations.
HSE Information Sheets	The HSE produce a number of information sheets relating to health and safety. They are normally referenced as CIS with a unique number to follow.
Interim Advice Notes	Interim Advice Notes (IAN) are issued by the Highways Agency as required to reflect a change in practice which is not already included in the Manual of Contract Documents for Highway Works (MCDHW), or where there needs to be some more expedient advice relating to changes of documents currently within the MCDHW. Examples include: IAN 63 Asbestos Management Applicable to the Strategic Road Network, IAN 69 Designing for Maintenance and IAN 105 Implementation of Construction (Design and Management) 2007 and the withdrawal of SD10 and SD11.
Isocyanates: toxic hazards and precautions	Isocyanates are used in certain types of bridge deck waterproofing systems and in certain paints.

Table D. Other Standards, Guidance, Information Documents, etc.	Interpretation
HSE Guidance Note EH 16	
Managing Asbestos in Premises HSG227	A comprehensive publication outlining the steps that must be taken to ensure that all asbestos containing materials within a premises are identified and managed safely.
Manual of Contract Documents for Highway Works (MCDHW) Volume 6	<p>The Highways Agency Departmental Standards and Advice Notes on Contract Documentation and Site Supervision Standards are contained in Volume 6 of the Manual of Contract Documents for Highway Works (MCDHW).</p> <p>They set out the requirements of the Highways Agency for the Service Provider to maintain those standards and ensure a co-ordinated approach to compliance with relevant health and safety legislation.</p> <p>For the full content of the MCDHW please refer to the Highways Agency.</p> <p>MCDHW Volume 6 contains the following standards relating to health and safety:</p> <ul style="list-style-type: none"> SA 8/94 Use of Substances Hazardous to Health in Highway Construction – MCDHW Volume 6, Section 2 Part 1.
Monitoring strategies for toxic substances HSE Guidance Note EH 42	General advice on methods and strategy for monitoring and sampling airborne concentrations of hazardous substances.
Permit to Work Systems INDG98	Provides information on formal written systems of work that should be used for potentially hazardous situations.
Pre-stressed concrete HSE guidance note GS/49	This document relates to pre-stressed concrete from a health and safety perspective.
Respiratory Sensitisers – a guide for employers HSE Leaflet IND(G)95(L)	This leaflet identifies known respiratory sensitisers and gives general advice on their use.
Safe use of ladders, step ladders and trestles HSE Guidance Note GS/31	This document provides a practical guide on ladder access.
Safety at Street Works and Road Works A Code of Practice	<p>A Code of Practice issued by the Secretary of State for Transport on the application of Chapter 8 of the Traffic Signs Manual. It applies to all highways and roads except motorways and dual carriageways with hard shoulders.</p> <p>This document is primarily aimed at operatives, supervisors and managers tasked with ensuring the safety of all street and road works.</p>
Successful Health and Safety Management HSE Guidance Booklet HS(G)65	This is a working document that acts as a guide on how to develop a health and safety management system. This document is aimed at directors, managers with health and safety responsibilities, safety professionals and representatives.

Table D. Other Standards, Guidance, Information Documents, etc.	Interpretation
The Highway Code	The Highway Code provides rules, legal requirements and a code of practice for road users
The Law on VDUs An Easy Guide HSG90	This document discusses the implications of complying with the Health and Safety Display Screen Equipment Regulations.
Traffic signs Manual – Chapter 8 – Traffic Safety Measures and signs for Road Works and Temporary Situations	A general standard of good practice for the signing and marking of obstructions as well as for the temporary traffic control necessitated by such obstructions of the highway republished in June 2006 in two parts: Part 1 – Design and Part 2 – Operations. Both parts are available for download from the DfT website (http://www.dft.gov.uk/pgr/roads/tss/tsmanual/). This is supplemented by the Design Manual for Roads and Bridges, including: Volume 8 – Section 2: <ul style="list-style-type: none"> • TA61 – Currency of the Traffic Signs Manual.
Vibration Solutions HSG170	This document provides practical ways to reduce the risk of hand-arm vibration injury.
Workplace Exposure Limits HSE Guidance Note EH40	Workplace Exposure Limits are given for a wide range of hazardous substances together with some advice on their method of use. This publication is regularly revised, usually annually.

1.5.1 Limitations

It is the intention that this document will be updated on a regular basis to take account of new legislation and ensuing best practice that arises, however it should be noted that legislation may change between the review periods and due cognisance must be taken of any such new legislative changes that may affect the Highways Agency, Service Provider and stakeholders using this document.

1.6 Accident and Incident Reporting System (AIRSweb)**1.6.1 Introduction**

In May 2006 the Highways Agency released a new Accident and Incident Reporting System (AIRS) to its supply chain to ensure that all RIDDOR (Reporting of Incidents, Diseases and Dangerous Occurrences Regulations) incidents are reported to the Highways Agency's National Health and Safety Team as well as to the Health & Safety Executive (HSE).

AIRS was developed in partnership with the Transport and Research Laboratory, the HSE and was trialled by two of the Highways Agency's construction supply chain partners, AmeyMouchel and Optima. The results of the trial demonstrated clearly that using AIRS provided the Highways Agency with earlier notification of incidents on the network and streamlined the notification of incidents to the Highways Agency and HSE.

AIRS allows the completion of a single incident report, which can be submitted to several organisations. It replaces the Highways Agency Work Site Accident Reporting (HAW SAR) form and can be used instead of the RIDDOR form F2508 to submit reports directly to the HSE.

A new version of the AIRS has been released, which being a web-based application is, named AIRSweb. This includes the submission of monthly summary information which is required to enable the Highways Agency to produce an accurate Agency-wide Accident Frequency Rate (AFR) for 08/09 and to meet other Ministerial reporting requirements. It is applicable to all supply chains including any Network Operations Schemes and Frameworks they manage.

Collation and subsequent analysis of this data will allow potential patterns or repeat accident/incident to be identified (across all Service Providers and the Highways Agency's supply chain partners in all areas) and may provide valuable information for design change or working practices for improved safety of those working on and those using the Network.

1.6.2 Requirements

All Service Providers must:

- Record all incidents on AIRSweb within 24 hours of them occurring. In this context incident means any accident, incident or 'near miss' on a Highways Agency contract or the Network, where the incident involves one or more of the following items:
 - anything that is reportable under RIDDOR;
 - any vehicle driven by a member of the public entering a works zone or colliding with temporary signing;
 - any member of the public being injured in the work zone;
 - any worker being struck by a vehicle;
 - any worker suffering an injury that requires medical attention from a paramedic, nurse or doctor;
 - any collision with a protection vehicle or with a crash cushion vehicle;
 - any collision between vehicles or equipment in the works zone;
- Inform the Service Manager immediately if the incident is a Fatality or Major Injury, reportable under RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995), or would generate press interest, and thereafter follow it up with an AIRSweb record within 24 hours;
- Attach to the original AIRSweb record, at the earliest opportunity following completion of the incident investigation, the final investigation report along with any relevant supporting documentation;
- Submit on a monthly basis, within 1 week of month end, total number of hours worked on site per calendar month and number of people employed on project / site per calendar month.

- Report to HSE in writing any fatality or serious injury; - this does not replace the immediate reporting by telephone / fax required by the HSE.

MACs / DBFO's must:

- monitor incident reporting for their Network and ensure that information for Spot Tendered Schemes, Works Frameworks and Construction Management Frameworks information is submitted;

The Service Provider must report to the Service Manager, for the benefit of the Highways Agency's National Health and Safety Team, all other accidents, incidents and near misses that occur while undertaking works on the Highways Agency's behalf. This in effect means all incidents that are recorded within the accident book / records.

1.6.3 AIRSweb Account

In order to use AIRSweb, the supply chain will require the creation of a user account and are encouraged to obtain this immediately. Service Providers seeking a user account should contact AIRS@highways.gsi.gov.uk and provide the following details:

- Name
- Address
- Contact telephone no.
- E-mail address
- Project or contract name they relate to

Once created the user will be provided with log-in details along with user guidance and a work instruction.

1.6.4 AIRSweb Information and Guidance

AMM 96/08: The Reporting of Supply Chain Incidents mandated the use of AIRS for accident and incident reporting. Those requirements, detailed at 1.6.2, remain although Service Providers are now required to use AIRSweb instead of AIRS.

AMM 97/08: The Gathering of Supply Chain Incidents, which introduced interim arrangements to enable the Highways Agency to calculate the AFR, is withdrawn. Such summary information provided in response to that AMM is currently being inputted to AIRSweb. All incident data reported on AIRS has been migrated to AIRSweb.

Further information in the form of a Work Instruction titled "Reporting, Recording and Investigation of Supply Chain Incidents" may be obtained from the Highways Agency's National Health & Safety Team or may be downloaded from SHARE, at <http://share/Share/livelink.exe/overview/1440489> or from the open homepage of PartnerNET, www.ha-partnet.org.uk.

Service Providers who are joint ventures should report under the joint venture banner with the involved party company adding to the "on behalf of" section within AIRSweb.

Spot Tendered Schemes, Works Frameworks and Construction Management Frameworks information should be reported by the Service Provider's specialists appointed for that contract.